AMERICAN Description of the second s

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING - SHEET METAL CONTRACTING



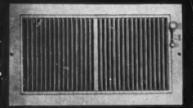
LANUARY 1944 DIRECTORY NUMBER

CONGRESS JUN 22 1945 Pullship

AIR CONTROL 15206 Registers • Grilles • Accessories

For 1944 Air Control offers a complete line of Registers incorporating the many innovations and improvements in both design and manufacturing methods that have established them in a position of leadership in the industry.

During the coming year we will do our utmost to give Air Control dealers and jobbers the best product and service that can be obtained.



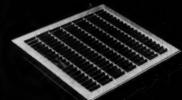
AIR CONDITIONING REGISTERS

Three distinctive lines of air conditioning registers—dual deflection, ver-tical deflection or horizontal deflection a type for your every need.



GRAVITY TYPE REGISTERS

A beautiful, sturdy line of Baseboard and Sidewall Registers with . ample free area for gravity installations plus adjustable fins for draftless air distribution when converted to forced air.



FLOOR REGISTERS

Grid type construction that is "heelproof," yet has ample free area. All popular finishes are baked with the Infra-Red Process - assuring long life and durability.

AIR CONTROL PRODUCTS - REGISTERS . GRILLS . CEILING VENTILATORS . ATTIC LOUVERS . DAMPER CONTROL SETS For prompt delivery of Air Control Products -- call your Air Control Jobber

AMERICA'S FIGHTING FORCES

COOPERSVILLE, MICHIGAN

ARMORED#PLASTIE

THIS NEW 1/4" PORTABLE ELECTRIC DRILL
IS 14% LIGHTER ... HAS MORE POWER PER POUND!



14 percent lighter in weight, more powerful per pound, cooler to handle, and far safer, the new Thor "Armored in Plastic" 1/4 inch portable electric drill brings remarkable new speed and operating ease to every war production drilling job.

The "Armored in Plastic" construction of this Thor drill is unique, for the tough, new, specially developed "Thorite" plastic does not support any operating parts, but serves only as a protective armor. In fact, the drill will operate perfectly with the plastic armor entirely removed!

The new Thor "Armored in Plastic" drill is available now to war industries. For full information send the coupon.

Advantages of the Thor U14K
That Speed Production and
Assure Long Service Life

MORE POWER PER POUND—Over-capacity, high-torque Thor AC-DC motor provides heavy-duty drilling power in light weight tool for continuous production service.

14% LIGHTER WEIGHT—Housing of tough, light "Thorite" plastic; skeleton motor-and-gear-frame of strong, light aluminum permits compact, weight-saving design without sacrifice of motor size or power. Only 3¼ lbs., the heavy-duty Thor U14K is 14% lighter than comparably-rated, old-style machines.

NEW HANDLING COMFORT—Smooth contours and "natural-fit" grip make the U14K comfortable to handle for continuous working. Perfect balance and light weight permits "finger-point" drilling accuracy with easy, one-hand operation.

COOL-RUNNING — Oversize fan and ample intake and exhaust slots circulate generous volumes of air through tool to make it extremely cool running. Heatresisting "Thorite" plastic housing stays cool in the hand.

GREATER SAFETY—"Thorite" plastic — a non-conductor — is added protection against shock. Three-conductor cable with ground wire and neoprene-sealed switch are other Underwriter Approved features

This Skeleton Frame is Secret Of Its Amazing Strength



This sturdy metal frame supports all internal operating parts of the Thorplastic drill, insuring close tolerance and permanent alignment of all parts. The plastic housing does not support any working parts, but serves only as a protective armor.

Housi	ng Parts of "THORITE" Plastic:
THOR'S 50th YEAR	Portable Pneumatic and Electric Tools INDEPENDENT PNEUMATIC TOOL COMPANY 400 W. JACKSON BOULEVARD, CHICALLY, Branchus in Principal Cirles

ADDITIONAL INFORMATION	Independent Pneumatic Tool 600 W. Jackson Blvd., Chica Please send full engineer on the new Thor "Plastic"	o, III.
Name		
City	State	

AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES SHERT METALS

AND



J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 113, No. 1 January, 1944 Founded 1880

CONTENTS -

1944's Most Vexing Problem Manpower	81
	32
	36
	88
	94
	95
	96
	99
Overtime Pay Requirements	
Kruckman—The Manpower Situation	
For Repair Sheets—P-84 or CMP-4 or CMP-9A	
In 1944—Report, Record—Or Be Penalized	
The New CMP-9A Order	
Interpretations, Amendments to Existing Orders	
On Our Industry's Front	
NWAH&AC Ass'n Says "Post War Will be Active"	
NWAH&AC Ass'n's Winter Meeting	
Nat'l Warm Air Ass'n History (Part 10)	-
Association Activities	~ ~
With the Manufacturers	-
American Artisan's War News	
amonous assessed was allows	_
THE RESIDENTIAL AIR CONDITIONING SECTION	
FPHA's Heating Correction Guide	19
Dealers Can Help Publicize Our Industry	24
	26
	29
Help Save Fuel—Sell Barometric Dampers	39
,	
THE SHEET METAL SECTION	
Gun Shields—Fabricated of Armor Plate	45
A Furnace Dealer "Keeps 'Em Fighting" 14	49
Strapping Makes Strong Non-Metallic Ducts	53
"Big Hoods" in a Heat Treating Department	58
Temporary Dies and Fixtures (Plane Heaters) 10	61

In This Issue

THIS issue contains, beginning on page 81, American Artisan's survey of the "Manpower" problem as it confronts our industry at the year's beginning.

It has become evident, as 1943 came to a close, that the "tough" problem in 1944 is to be manpower. For example, cast iron furnace manufacturers now can get all the pig they can use. But that does not mean cast iron furnace production will go up by leaps and bounds in 1944.

The stumbling block to increased cast iron furnace production will be manpower, and as this issue goes in the mail there doesn't seem to be any ready remedy for manpower shortages.

Contractors, as shown in the study on pages 82 and 83, also faced increasing shortages of mampower as 1943 went along and, again, there doesn't seem to be any quick and easy solution at hand.

The only two procedures which can help matters, for either manufacturers or contractors are (1) try to find more men; (2) try to hold the men already working. Each procedure requires a different line of attack.

American Artisan, therefore, devotes several pages of this study to the problem of getting new men and holding old ones. The information presented was gathered over a period of several weeks in Washington and by mail from men in WMC, WLB, SSC who, we are told, are in a position to make suggestions. The procedures presented are, then, the best information available at this time. at this time.

Further, since the questions of raising salaries and wages in order to satisfy employees is one solution we naturally turn to, this study also presents the latest information on these questions.

Additional articles in the study, fill in the other important questions confronting the industry or likely to do so.

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for PUBLIC BUILDINGS-INDUSTRIAL BUILDINGS HOMES and HOUSING PROJECTS



SAL-MO Supply Duct is SAFE—Approved and Listed for Safety, Permanence and Heating by UNDERWRITERS' LABORATORIES, INC. COMPACT—Exclusive folding feature saves space in cars, in storage and in transfer to job; saves time in erection. INSULATING—Built-in insulation assures years of fuel saving. LIGHT—Weighs less than 8 oz. per square foot. STRONG—Withstands Mullens Test of over 400 pounds per square inch. MOISTURE-RESISTANT—Fabricated entirely with insoluble adhesives; high humidity will not separate the various layers.

FOR WARM AIR HEATING, VENTILATING AND AIR CONDITIONING SYSTEM DUCTS

Manufactured in 26 standard sizes (areas from 26 square inches to 448 square inches in convenient 4-foot lengths) allowing for all types of installations. It is also furnished in flat sheets containing 11 to 24 square feet which can be easily rolled or scored on the job.

Other Well Known Sal-Mo Products Include:

Asbestos Papers, Aircell Papers, Ductboard, Pipe Coverings, Millboard, Tank Jackets and Asbestos Furnace and Boiler Cements.

A Typical Duct Installation In a Large Church Building. Sal-Mo Supply Duct Was Used Throughout.

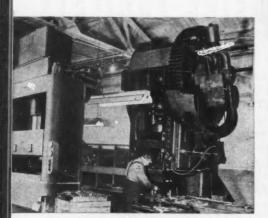


SALL MOUNTAIN COMPANY

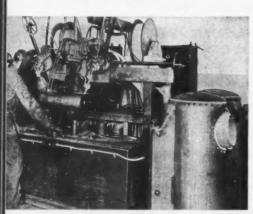
NEW-GREATER-



Section of steel shell department.



Modern, heavy duty presses.



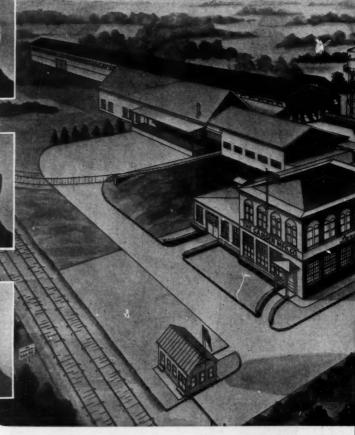
Automatic electric seam welder.



C. A. Olsen President







THE new, greater Luxaire plant is the outgrowth of our country's tremendous war production program. To carry on our commitments in the production of vital war materials, the Luxaire plant, equipment, and facilities had to be greatly increased.

To meet this emergency, Luxaire in the past year, has more than doubled the size of its manufacturing plant, located in Elyria, Ohio, at the junction of the New York Central and Baltimore & Ohio railroads.

New and modern steel fabricating equipment has been acquired, so that material required by our fighting forces can be produced in less time and in greater volume.

THE COMPLETE PRE-WAR LINE OF LUXAIRE WARM AIR HEATING & AIR CONDITIONING UNITS











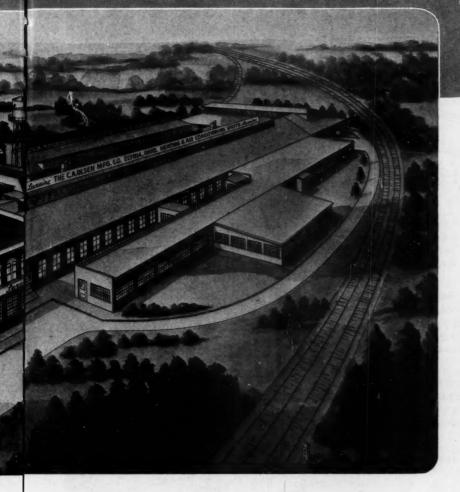




Series G Series H Series 8000
Gas Fired Gas Utility Air Oil Burning Air
Gravity Unit Conditioning Unit Conditioning Unit



Luxaire PLANT



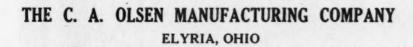
Ample dock space for shipping and receiving via truck or railroad.

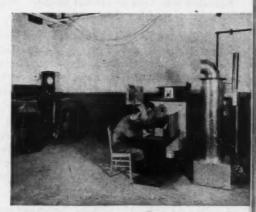


Modern and efficient shipping room.

Illustrated on these pages are views of the enlarged and modernized Luxaire plant.

When victory is won, the invaluable experience gained in fabricating weapons of war will be applied to the production of Luxaire Warm Air Furnace and Air Conditioning Units—steel and cast iron, for coal, gas and oil—that will set a new high standard in design and construction.





Research and development department.

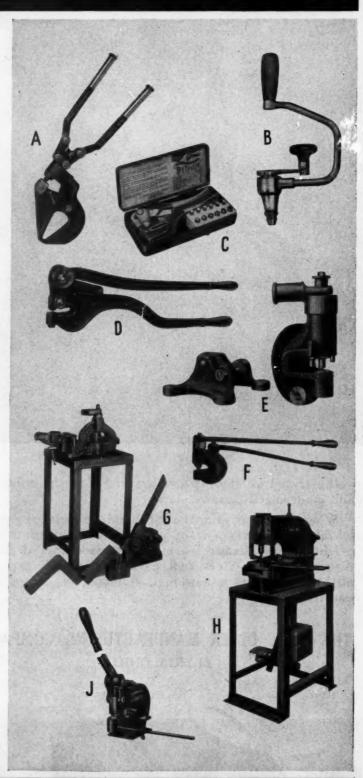
Luxaire

TS

WARM AIR FURNACES
AIR CONDITIONING UNITS
FOR COAL...GAS...OIL

30 Years Experience Whitney-

- A. AIRCRAFT RIVET SQUEEZERS. Standard, Alligator, Crab, Snake Head, and Pelican types for handling aluminum rivets up to 5/32" size. Pelican type (shown) in 6 sizes from 13/4" to 6" throat depth, other types in a total of 25 different sizes.
- **B.** BLIND RIVET PULLER. For setting various kinds of stem or mandrel-type blind rivets. Chuck pulls directly on center with full bearing around head of rivet. For brazier or flush rivets in ½", 5/32", and 3/16" sizes. Removable brace-type handle.
- C. NO. 5 JUNIOR PUNCH. A handy tool for all sheet-metal workers. Capacity 1/4" hole in 16 ga. iron. Comes in metal kit box with 7 punches and dies. Has adjustable depth gage, strength, durability, and accuracy. Popular the world over.
- D. NOS. 7, 7½, 8 IMPERIAL PUNCHES. General-purpose lever-action punches of proved service-ability. Capacities, ½" hole in ½", 3/16", and ½" iron. Will punch inside 90° corner. Quick-change punches and dies. Lever will not disengage on over-travel.
- E. NO. 20 BALL BEARING PUNCH. Powerful action gives tremendous power in a light-weight tool. Weight only 20 lbs., yet will punch 1/2" hole in 1/2" iron. Easy to use in any position, or can be mounted on bench base shown for shop service.
- F. NO. 10 BALL BEARING PUNCH. Same powerful action for high capacity with light weight. Will punch 3/8" hole in 1/4" iron and weighs 81/2 lbs. Available with fixed or ratchet handles. Also bench base for production shop work if desired.
- G. NO. 455 ANGLE IRON COMBINATION. Shear, Notcher, and Bender, all mounted on a sturdy, welded-steel stand. Provides greatest convenience, speed, and accuracy for fabricating angle iron pieces. Rugged, and easy to use. Capacity, 2" x 2" x 1/4" angle iron.
- H. TOGGLE ACTION FOOT PRESSES. Powerful linkage multiplies foot power to provide fast, easy action on punching and forming operations. Four sizes 7", 10", 18", and 24" throat depth. Capacity, 2" hole in 16" gauge iron, 100 holes per minute or better.
- J. NO. 17 BENCH PUNCH. Improved model has welded steel frame, lighter weight, new depth and side gauges, greater throat depth, and 6" x 8" work table if desired. Capacity 1/4" hole in 1/4" iron. Highly adaptable and widely used for production line operations.



WHITNEY METAL TOOL COMPANY

JENSEN Over 80 Useful Products



POWER SQUARING SHEARS

Quick in action, easy to operate, compact in size Made in 36" and 42" sizes, for 14 and 16 gauge iron. Features include a simple, accurate, and positive blade adjustment and a high speed of 180 strokes per minute. Built-in motor drive with pushbutton control. Side, front, and back gauges fully adjustable. An ideal small-size machine for sheet metal shops.

NO. 247 PRESS BRAKE

A small, power-driven press brake for moderate-sized work in jobbing and production shops. It is powerful, extremely sturdy, fast, easy to adjust, accurate, and has a number of distinctive features. Welded steel frame, stroke adjustment 1", throat depth 61/4", 1 h.p. motor, 47 strokes per minute, capacity 14 ga. iron. Die bed is 18" long, ram and die shoes machined for 1/2" tongues on standard dies.

POWER PUNCH PRESSES

Economical machines for powerful, accurate, durable service. Many safety features. Capacity 10 tons, length of stroke 11/4", stroke adjustment 13/4", die space 6". Comes in 2 sizes, 12" and 18" throat depths. Welded steel frame and welded angle iron stand. All parts accurately machined. Flywheel at rear, out of way of work. Built-in motor drive and push-button controls.

BENDING BRAKES

Whitney-JENSEN Brakes are famous for accuracy and durability with light weight, made possible by a distinctive construction design. Smaller sizes are 20 ga. capacity, 49" length, in bench or floor types, plain or combination models. Larger sizes are in 12, 14, and 16 ga. capacity, 4, 5, 6, 8, and 10-foot lengths for combination work on box and pan as well as all types of straight bending.

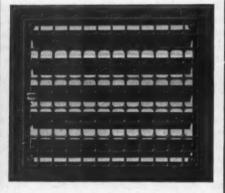
AND MANY OTHER ITEMS ...

With 30 years experience, the Whitney-JENSEN line includes over 80 different useful items for the sheet metal and allied trades. Write for the new 48-page Whitney-JENSEN Aircraft Tools Catalog showing the latest developments in our most popular modern tools.

FORBES ST. • ROCKFORD, ILL.



H & C No. 75 — with the incomparable TURNING BLADE VALVE — and all the other H & C quality-built Air Conditioning Registers - Nos. 69, 74 and 88 - are available for prompt shipment.



No. 200 Floor Register - a favorite for many years - is now being made in all of the following sizes: 6 x 8, 8 x 10, 8 x 12, 9 x 12, 10 x 12, 10 x 14, 12 x 14, 14 x 16, both black and oak finishes. Pinched back fretwork assures rigidity and large air capacity.

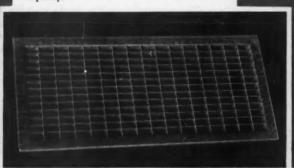
me ARE PRODUCING

1F you have heard conflicting rumors concerning whether or not we are manufacturing registers, you can now put those rumors to bed, for we ARE making registers. We're located in a non-critical labor area, which under WPB order M-126 permits us to manufacture — and we're doing so to the full extent of our C.M.P. allotments.

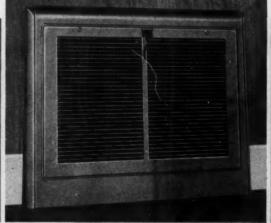
ALTHOUGH we can't make all the registers we would like to, we ARE in a position to take care of all essential current needs. Hence, your orders will be appreciated as always.

ALL the registers indicated here, as well as our Nos. 330 and 345 Sidewall Registers, are available for prompt shipment; and they're all of the same top-notch quality you have come to expect from H & C. Use the best; they are no more expensive.

For details see our current catalog No. 42 of Gravity Registers, Air Conditioning Registers, and Accessories.



H & C No. 265 "NO-FLEX" Return Air Face—perfect for Maintenance and Repair. Neat and trim, as sturdy as its name indicates. 84% Free



H & C No. 130 - Finest Baseboard Register made. Excellent for conversion. Available in all standard sizes, M L finish only.

HART & COOLEY MANUFACTURING CO., HOLLAND, MICH. World's Largest Manufacturers of Registers, Grilles and Furnace Accessories Cuttype

Bear

Randall

PROVED IN WAR ASSURED FOR PEACE

This line of Randall Bearings has helped in almost every phase of the war effort on production and combat

Our engineering and production departments have produced Randall Graphite Bronze Bearings and Self-Alignmachines. ing and Self-Lubricating Pillow Blocks to meet the most rigid government specifications. Steadily improved during more than a third of a century, Randall Bearings were ready for exacting war needs and are ready for peace. Their quiet operation added to other efficient features has given them the top place on furnace blower

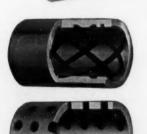
With more than TWO MILLION Randall Self-Aligning and air conditioning equipment. and Self-Lubricating Pillow Blocks installed on air handling equipment Randall continues in its leadership, giving assurance that more economical and efficient bearings will be available for peace-time use. Consult our engineering department without obligation. Write for catalog and price list.



Randall One Piece Steel Housing Pillow Block with single or double oil reservoir, mounts in any position.



Randall Standard Pillow Block is a self-aligning, self-lubricating, all-purpose, rugged pillow block that will last a lifetime. Single reservoir only.



Cut-away sections of two of many types of Randall Graphite Bronze Bearings. Send for new complete Graphite Bronze Bearing catalog.



Randall Flange Pillow Block is ruggedly constructed with ample safety factor for the most severe applications. Has double oil reservoir.



Randall Universal Pillow Block will operate in any position under severest conditions. Has double oil reservoir.

RANDALL GRAPHITE PRODUCTS CORPORATION Dept. 111 609 W. Lake St. Chicago, III

FOR ALL HEATING UNITS

IN STOCK FOR IMMEDIATE SHIPMENT GUARANTEED TO FIT

ALSO A COMPLETE STOCK OF

ASBESTOS PAPER & CEMENTS
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DRAFT REGULATORS
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FILTERS—DUSTOP
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FURNACE CLEANERS
HUMIDIFIERS
REGISTERS
TANK HEATERS
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ORDER ALL FROM

BRAUER
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ON PA

A. G. BRAUER SUPPLY CO.

100 Washington Ave.,

St. Louis, Mo

USAIRCO EQUIPMENT

designed and engineered for efficient heating and air-conditioning



Blower Assembly



Blower-Filter Unit—Packaged in a compact, attractive, sturdy cabinet, and engineered to do a real job at low cost, the UsAIRco Blower-Filter unit has plenty of sales-appeal.

It is simple and efficient in design—harmonizes well both from appearance and engineering the sales and engineering the sales are sales.

gineering standpoint with modern heating installations in stores, community buildings and homes. Widely used in furnace installa-tions for winter heat distribution and summer cooling. The large filter area in these units holds from 3 to 12 filter mats in the standard sizes. Combining a high standard of performance, and economy in operation, the USAIRCO

Blower Wheels - Scroll Housings-Blower Assemblies



Forwardly Curved Wheel



Scroll Housing



Blower-Filter unit builds up repeat sales for itself on the job. There are six standard sizes for residential and commercial air conditioning installations with capacities from 800 to 6000 CFM. See catalog No. 440-BF.

Type "E" Blower—Light-duty belt-driven blowers specially designed for exhaust applica-tion in kitchens, dining halls, factories, stores and warehouses where static resistance is fairly low. Priced low to assure sufficient profit on

every installation.

It is easy to service and replace Type "E"

Blower parts. Standard high speed 1750 RPM

usAIRco designs and manufactures wheels, housings and assemblies for the special needs of furnace manufacturers, makers of air conditioning units, dryers and special equipment.

The usAIRco Blower assembly rates high because of its wide adaptability. As an integral part of a fuel-conversion unit it is capable of effecting worthwhile economies in heating.

Blower assemblies in either double inlet or single inlet types may be adapted to warm air furnace installations or incorporated in unit air conditioners or blower-filter units.

Operating records underline two important features which have made usAIRco Blower as semblies long-time favorites in the heating and air conditioning field: they are extremely quiet; engineered for trouble-free, vibrationless operation.

usAIRco Wheels, Scroll Housings and complete Blower assemblies have a reputation for dependability . . . a wide acceptance everywhere, because they are designed to make profit for both seller and customer. Details in usAl Rco Bulletin 440-F.



motor. Adjustable motor pulley permits 30% speed variation for handling air volume as required. Available in several discharge arrangements. Catalog 440E.

"SU" Blower-"SU" Blowers are designed to handle exhaust requirements where space re-strictions or other installation factors will not permit the use of belt-driven blowers. Direct connection of motor and wheel saves

space, eliminates the friction of belt or gear drive. A slow speed motor operates the impeller. The "SU" exhaust blower is a single rigidly welded unit, lessening vibration. Catalog 440-E.

At war's end, usAIRco Evaporative Cooling units will again be available. They will find a ready market, because usAIRco units have built up an enviable record for dependable low-cost cooling in stores, theatres, recreation centers and commercial installations of many types. Dealers will welcome and profit by the return of the efficient, packaged system of low-cost evaporative cooling pioneered by usAIRco. For details, write for Bulletin No. 460.

UNITED STATES AIR CONDITIONING CORPORATION

Manufacturers of the most complete line of air handling ment. Factory representatives in principal cities.



NORTHWESTERN TERMINAL MINNEAPOLIS 13, MINNESOTA

GAS

OIL

COAL



Mueller Series G-90 Gasfired Gravity Furnace— Highly efficient up-draft design. Round or square casing.



Mueller Series CVP Allcast-iron Gas-fired Winter Air Conditioner — Compact cabinet for utility room or basement,



Mueller Series 50 Oil-fixed Winter Air Conditioning Furnace - Small size with either suporizing or pressure atomizing burner. Two larger sizes with pressure burner only.



Mueller Coal-fired Castiron Furnace—Cast iron, gravity type.



Mueller All-cast-iron Coal-fired Winter Air Conditioner — All parts completely enclosed in one cabinet.



Mueller Series SHP Steel Gas-Fired Winter Air Conditioner - Attractive, compact cabinet type for utility room or basement.



Mueller Levelizer - Regulates gas flame up and down, to match the weather.



Mueller Pressure Atomizing Oil Burner—(patented). "Spinning" flame burns every drop of oil — gives clean, odorless fire.



Mueller W G-42 All-castiron Coal-fired Gravity Furnace — Capacity 42,-000 Btu output at register. Standard return flue radiator.



Mueller WR-72 Coal-fred Winter Air Conditioner — Capacity 72,000 Btu output at bonnet. All cast iron. Standard return flue radiator.



Mueller Seasonstat — All Mueller automatic heating plants may be equipped with this latest comfort control which keeps the heating plant in step with the weather.



Mueller EPS Gas-fired Winter Air Conditioning Furnace — Sectional type forced-air unit. For residential usage.



Mueller Series OVP Vertical Oil-fired Winter Atr Candilianer — Equipped with Mueller Vaporizing Burner, Burner and controls enclosed.



Mueller Double-radiator Furnace — forced-airtype — Tubular design and heavy cast-iron construc-



Mueller Double-radiator Furnace — Gravity type, Tubular design — heavy cast-iron construction.



Mueller Series
A and AE Gas
Era Boiler —
for steam, hot
water, or
vapor. For residences and
small commercial installations.



Mueller Series C Gas Era Boiler — Steam, hot water, or vapor heating; direct or indirect hot water supply. For larger residences, apartments, stores, commercial and industrial buildings.



Mueller Series OHP Horizontal Oil-fired Winter Air Conditioner — Equipped with Mueller Vaporizing Burner, Burner and controls exposed.



Mueller Coal-fired Steel Furnace - Gravity type.



Mueller Steel- Coal-fired Winter Air Conditioner — All parts completely enclosed in one cabinet.





Mueller Gas-fired Unit Heaters — Space-heating unit for factories, warehouses, hangars, shops.

1



Mueller Vaporizing Oil Barner - Air for combustion supplied by mechanical blower Safety float control.



Mueller Stoker-fired Furnace — forced-air type. No fly ash accumulations, integral clinker chute.











benefit by selling MUELLER'S complete line

Sooner or later, the reduction of war production will release materials for civilian use — and you will again have requests for a wide variety of heating requirements. It pays to become known as the dealer for one reliable manufacturer who can help you meet any or all of these requirements — and who can give you, from a line that is really complete, exactly the right furnace for any job.

Mueller is — and has been for many years — one of the outstanding companies which can provide you with a complete line of equipment — furnaces for homes of any size, type, or price range . . . also for commercial installations — specifically designed for coal, oil, and gas.

Mueller dealers benefit by selling a complete line, nationally known and nationally advertised, for a successful post-war business. Contact your nearest Mueller distributor or write: L. J. Mueller Furnace Company 2010 W. Oklahoma Avenue, Milwaukee 7, Wisconsin.

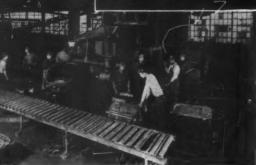
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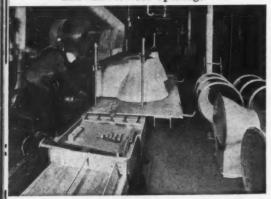
Modern Methods



ection of Iechanical Ioulding 'epartment



Special Equipment for Grinding Feed Section and Ash Pit Door Openings



Furnace Assembly and Conveyor Line

FROM the time one of the sandslinger moulding machines "rams" an ashpit, firepot, feed section or radiator mould, until the complete furnace rolls down the conveyer line in the final assembly department, modern methods and modern equipment are used in the manufacture of Moncrief Furnaces.

Similar efficient methods and machinery are used in the manufacture of Moncrief Furnace Pipe and Fittings.

The experience gained during the past 50 years, plus the excellent facilities of the huge Moncrief plants at Medina, Ohio, give the products of this old and favorably known organization the modern features and advantages that are wanted in the 1944 market.

New, modern manufacturing equipment is being added now and more will be added later as quickly as conditions permit.

THE PRE-WAR MONCRIEF LINE OF WITH A BACKGROUND



Series C Coal Fired



Series E Coal Fired



Series C Coal Fired



Series S Coal Fired

in Manufacturing-



MINISH

General Offices

For no effort will be spared to maintain Moncrief manufacturing methods fully as modern as future furnace standards dictate.

When better heating equipment, furnace pipe and fittings are built, Moncrief will build them.

THE HENRY FURNACE CO.
MEDINA, OHIO



WARM AIR FURNACES • FURNACE PIPE AND FITTINGS AIR CONDITIONING SYSTEMS FOR COAL . . GAS . . OIL

Sheet Metal Department



Modern Equipped Pattern Shop



Machine Shop and Maintenance Departme



FURNACES AND AIR CONDITIONING UNITS OF ALMOST 50 YEARS



Series G Gas Fired



Series GG Gas Fired



Series HBG Gas Fired Utility Air Conditioning Unit



Series Special
Oil Fired



ARE YOU AN UNSUNG BASEMENT HERO?

Of course you are — but we know you're not worrying about the fact that everybody doesn't recognize the importance of the job you are doing. The really vital thing is that you heating dealers and service men are performing a mighty big part in the war effort.

To "keep the home fires burning" is just as vital in this war as it was in the last, although there's been less singing about it now than there was then. Health, efficiency of workers, and morale all depend in a large measure on proper heating.

It has been, and still is, a difficult job to keep existing heating plants in service, functioning as efficiently as possible. Heating men have the solid satisfaction that they are meeting the situation ably and effectively.

Penn assures you that we appreciate your work...and are anxious to be as helpful as possible. We are prepared to supply necessary Penn controls for all types of heating as liberally as existing priority rules will permit. Penn Electric Switch Co., Goshen, Ind. In Canada: Powerlite Devices, Ltd., Toronto, Ontario.



AUTOMATIC . CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

RACLE MOTOR CAR REFRIGERATOR TOMORROW

Save or Slave— Buy War Bonds



POST WAR

Pipe Dreams

Post war is going to bring us many breath-taking innovations, according to the pipe dreamers. Almost immediately after the peace, is signed we can trade in the old jaloppy for a car of teardrop design which will ride over the roads, fly in the air, or swim. To drive it all you will need do is press buttons on the instrument board. (But Heaven help you if the back seat driver reaches over and presses the wrong button.)

And the post war house? Well, there the starry-eyed pipe dreamers really let themselves go. Let's not even discuss the design because you'll be able to change that to suit yourself twice a week by merely manipulating convenient sliding walls and disappearing floors. Every convenience you can think of, including self-dumping ash trays and a device which automatically puts out the cat.

The refrigerator, they tell us, will consist of a series of various sized compartments built into the kitchen wall, also operated presumably by an ingenious instrument board. When the housewife wants to get dinner she presses a button and out pops a beautiful T-bone steak. Other buttons produce vegetables, butter and milk, not to mention bottled beer.

If the old man wants a highball instead, pressing the right button dumps ice cubes into his glass together with the other important ingredients—provided the pipe line from the liquor store hasn't got clogged. (And what's so new about that?)

A couple of long extra drags on the pipe produced the post war dream heating equipment. It will be so different from any heating equipment now in use that only by labeling it carefully will the furnace dealer be sure he is not selling a television set or an atom crusher. Installed on the roof of the dream house, it is designed to draw heat from solar energy, making fuel unnecessary.

How this is to be accomplished is a minor detail which the dreamers haven't quite got around to yet. But, of course, they will, so get your order in quick and aid the Scrap Drive by junking your present obsolete equipment.

* * * *

Fantastic? Sure, but if the picture is overdrawn a little, it's simply to make a point. We don't say the post war dreamers are all wrong, but we suspect that some of them are just a little too far ahead of the parade. Certainly there'll be changes—radical changes—in many post war products. But we don't believe they will come so suddenly as to upset industry's apple cart overnight.

As far as heating equipment is concerned, decided changes and improvements are in the cards. From time to time important new features will be developed as a result of research and experiment. But for some little time after the war, with all the coming changes, a furnace still will be recognizably a furnace.

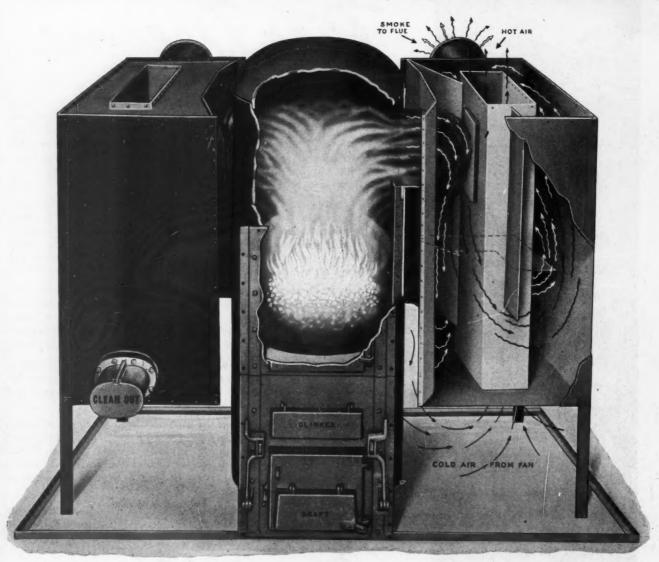
New trends in design and principle are being followed closely by RYBOLT engineers. We are not promising miracles but when the green light is given for post war heating equipment RYBOLT will be ready to go, with a line that any jobber or dealer will be proud to handle.

THE RYBOLT HEATER COMPANY

615 MILLER STREET

ASHLAND, OHIO

PEERLESS Commander Heavy-Duty FURNACE



CAPACITY TO 3/4 MILLION B. T. U.'s

FOR EXTRA LARGE BUILDINGS, SCHOOLS, BARRACKS, FACTORIES, ETC.

Note the dual radiators, which practically double the heating surface of this big heavy-duty furnace. Note (arrows) the long travel of smoke and gas through radiators to smoke pipe. Note how heat divides and goes equally into the two radiators—also how the series of baffles force the heat to outside surface of radiators, where it is wiped off by return air from blower.

Note the large size combusion chamber. Total

grate area, 1,048 square inches. Locomotive type grates. Total heating surface, 30,959 square inches... Built of extra heavy boiler plate, riveted and welded. Smoke-tight, gas-tight, dust-tight. Burns either coal, coke or wood. Adaptable to either hand-firing or stoker operation. For most efficient operation a PEER-LESS Cleanaire Blower is needed. Available under W.P.B. regulations.

Wire or Write for Descriptive Literature and Complete Information on other sizes of Poorless Warm Air Furnaces.

THE PEERLESS FOUNDRY COMPANY, Indianapolis, Ind.

Pioneers in Warm Air Heating for Over a Third of a Century

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PEERLESS

In Step for Victory

Here at Peerless we are making no predictions as to when the war will be over. But we are looking ahead—and planning ahead—for that happy day. When it comes, Peerless will be ready to resume normal manufacturing operations. (Of course, Peerless furnaces are available now—under proper priorities.)

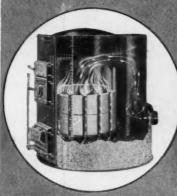
We are now using all of our facilities in in effort to meet our first obligation of helping to win the war. However, our designing and engineering departments are finding time to work on improvements for Peerless warm air heating plants—so that Peerless dealers will be assured of the latest design and maximum efficiency for their post-war selling job.

REPAIR PARTS

fortunately for Peerless dealers, our large tock of parts has enabled us to take care f most orders promptly and satisfactorily. We are still in a position to furnish parts or most makes and models of warm air eating plants. Dealers who build a war-ime reputation for prompt, satisfactory reair service are building the soundest posible foundation for their post-war business.

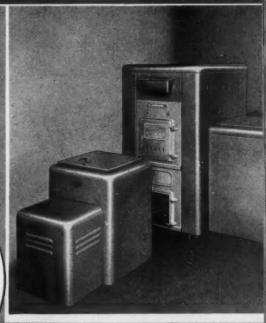
Latest design PEERLESS

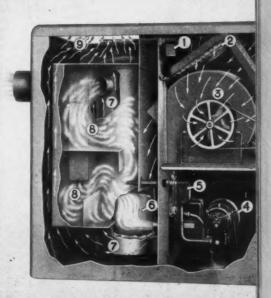
Streamliner steel furnace,
complete with large, silent
blower, filters, automatic humidifier. Truly a DeLuxa unit
at a remarkably low price.
Ecautiful baked onamel finish.



Here is another exceedingly popular unit in the complete PEERLESS line. PEERLESS
round type furneces—in either
steel or cast iron—are designed
and built to give dependable,
economical service for a long
period of time.

PEERLESS MASTER Automatic Furnace for small and medium size homes. Note the compact simplified arrangement of all the component parts and the intricate maze of baffling in the hig radiator that delays passage of flue gas to chimney.





PERLESS FOUNDRY COMPANY

DIANAPOLIS, INDIANA, U. S. A. • Ploneers in warm oir heating for over a third of a centur

The Answer to your V-PULLEY PROBLEMS



Maurey V-Pulleys, once installed, perform continuously without attention. Their quality is taken for granted, because users quickly recognize the superior Maurey design and sturdiness.

Use Maurey V-Pulleys for trouble-free performance.

MAUREY

AURET MANUFACTURING CORF.

PULLEYS

2015 South Wabash Ave., Chicago To, Ill

DOING a WARTIME TASK READY for the POST WAR JOB

But - When the Last Gun is Fired and the Last Bomb is Dropped, U.S. will be right back in Pitching and Producing Registers, Faces, Grilles, and Complete Requirements for Gravity and Air Conditioning Installations to meet what will be the Greatest Demand this Country and Industry Our Equipment is Intact and in Perfect Condition - more Modern

have ever experienced.

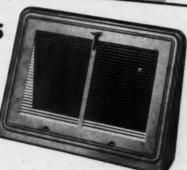
than ever and ready for Full Speed Ahead



No. 40 SERIES

GRAVITY BASEBOARD REGISTERS

Today's finest! Least Today's finest! Least resistance—complete non-vision of Register Interior with Removable Register Face and Convenient Face attaching feature. Leakproof when properly installed.



No. 256 4-WAY FLOW AIR-CONDITIONING REGISTERS

Complete, versatile control
. . . beautiful
exterior! Vertical Face
Bars adjustable to desired
lateral airflow
with bending
Wrench.
Lever-operated Horizontal Renr
Valves for
Upward or
Downward
Deflection.

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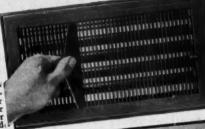
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No. 400 TRUSSTEEL

No. 153 LOUVRE TYPE AIR-CONDITIONING REGISTERS



The lowest total t

A heel proof register with maximum free area, structed with new multiple valves running short way for easier operation and cleaner walls.

Send for:

Catalog 41G Gravity Lines Catalog 41AC Air Conditioning Lines Catalog 41F Pipe and Fitting Lines

ES REGISTER CO. VITED S

ALBANY NSAS CITY MINNEAPOLIS



WARMCO SHOP NEWS

THE AMERICAN ROLLING MILL COMPANY, MIDDLETOWN, OHIO

Do You Have a Copy Of This 48-Page Book On the "Short Method"?



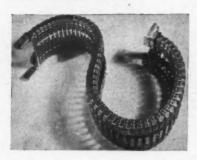
Laying out sheet metal patterns can be simple, easy, quickas this useful 48-page booklet explains. It gives you improved short cuts to pattern development that

saves valuable time, reduces the chance of error and speeds the work.

And it is written in such "easy language" that even apprentices and trade school students will find it valuable, both as a text and as a reference

To get a copy of "Short Method of Pattern Development," write Market Development Division, Armco, Middletown, Ohio, and enclose 30 cents to cover printing and mailing costs.

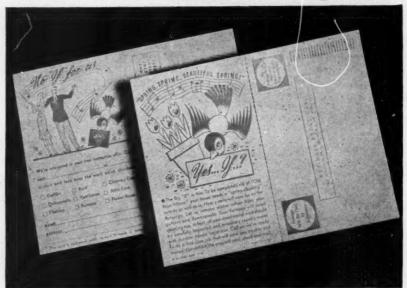
Stainless Helps Feed the Guns!



Stainless steel is proving itself to be a highly workable metal day after day in this war. This Armco Stainless Steel ammunition chute is an interesting example. It carries .50 caliber bullet-filled belts to a bomber's machine guns.

Because Armco Stainless is durable and strong and resists abrasion and corrosion, it is ideal for this flexible chuting anywhere it's used: in desert or jungle, at sea, in cold or heat. There are no rust particles to gather on cartridge or belts; no jammed feed lines when a gunner gets the enemy in his sights. (Memo: For exacting post-war jobs that require a "topflight" metal, remember ARMCO Stainless has possibilities for you.)

Here's a Business-Getting Card



Do people in your town know that you can get galvanized sheet metal for repairs and maintenance of homes and business buildings? The card shown here will help you draw their attention to this fact, and remind them to call on you for this work when the time comes for Spring repairs and reconditioning.

The cards, neatly imprinted with the firm name and address, are supplied free to sheet metal contractors who use Armco Ingot Iron. Thus it will cost you only a penny for each card you mail to your prospects for this work, and two cents for

those returned by people who want to talk to you about doing their repair jobs. That's very little to pay for inquiries for repairs on gutters, downspouts, flashing, roofs, ventilators, furnaces, chimney caps and attic fans.

For your supply of these cards, just write to the Market Development Division, Armco, Middletown, Ohio, and be sure to mention the name of your Armco Distributor. Also give us your firm name and address for the imprint; the number of your postal card permit (check with your postmaster if necessary) and the number of cards you can profitably use.

From Our V-Mail

Managing Editor (now Ensign) Win Arnold, on leave from Shop News to fight Japs, V-mailed recently from the South Pacific that the natives had just brought in a Nip prisoner-an officer-tied snugly with barbed wire and carried on a stick. "Squeal like pig-carry like pig," the natives explained in broken English.

You can take Win's word for it that sheet metal plays a vital part in warfare. When American antiaircraft batteries bagged a Zero not long ago, Arnold hacked off a piece of the fuselage, snipped it into round "coins," mailed the thin-gage, brightly painted souvenirs home. (Editor's

note: It wasn't ARMCO PAINTGRIP. The Jap paint is already peeling!)

"School on Stainless"

There will be lots of profit-making jobs to do with stamless steel when peace comes-every forward-looking contractor can agree with that. So now's a good time to learn all you can about fabricating, welding, soldering, cleaning and other operations with this rustless metal.

In making your post-war business plans, you'll want to write for detailed how-to-do-it facts on Armco Stainless Steel or other metals. Address your letter to the Market Development Division, The American Rolling Mill Company, Middletown, Ohio.

Your Post-War Plans Are Already Made

When it comes to Humidifier Water Control



WE never started on a job that looked easier, or proved tougher, than the making of a dependable float valve for the humidifier pan of warm air furnaces.

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When we brought out the McDonnell Humidifier Water Control back in 1939, we thought we had the problem completely licked. As a matter of fact we did make a big improvement over the old type of float valve — the kind that slowly cracks open when the float drops and simply dribbles water into the pan. This seeping or dribbling action wasn't sufficient to keep the valve orifice clear and prevent lime or dirt from plugging up the valve. So the basic problem was to design a full-flow valve.

Our "snap action" valve accomplished this. It was designed to snap wide open whenever the float dropped a quarter-inch. The full stream sluiced out the orifice—kept the valve in good operating condition. But while it represented a big advance over the old way, we frankly admit that there was still room for improvement.

We like a tough problem of this kind; so we have sailed into it in dead earnest. The period when production was practically stopped proved an excellent opportunity for intensive research, field studies, and re-designing. As a result, the "snap action" has now been brought to a remarkable stage of perfection; a new type of float with better action has been developed; many fine-spun changes have been made that truly achieve a new standard.

MSDONNELL & MILLER
1318 Wrigley Building, Chicago 11, Illinois

Doing One Thing Well





AUTOMATIC OIL BURNING FURNACES

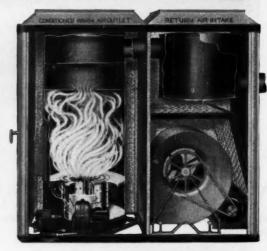
WINTER AIR CONDITIONERS

In brown ripple, insulated cabinets.

Model No. 125— 90,000 B.t.u. Model No. 150—120,000 B.t.u. Model No. 250—150,000 B.t.u.

Easy access to inner chambers through panels, front and rear. Double Baffle in heating drum, Automatic Oil-Air Control set, Automatic Humidifier, Combination Limit Control and Blower Switch and Automatic Draft Regulator — Standard equipment.





FULL FORCED UPRIGHT >> >

Model No. 104, 70,000 B.t.u. furnished complete with Automatic Oil-Air Control set, Combination Limit Control and Blower Switch and Automatic Draft Regulator and full insulated cabinet. Automatic Humidifier, Filter—optional. Mechanical draft blower does not operate low fire position as .02 draft is sufficient for a clear low fire.

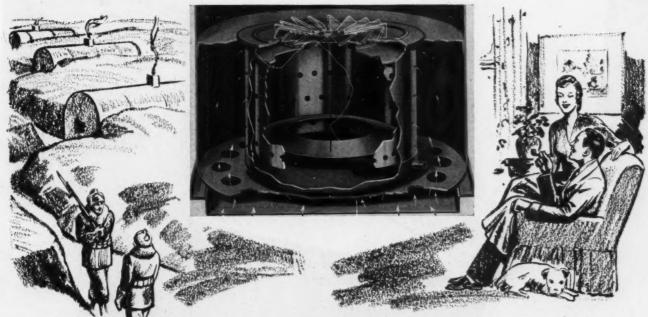
■ ■ AUTOMATIC OIL BURNING HOT WATER HEATER

Extra large galvanized storage tank plus extra fast recovery rates assure plenty of hot water at all times. 100% automatic. Aquastat control has three settings, Warm, Medium, Hot; water temperatures 110° to 140° to 160° respectively. 5-inch MONOGRAM "Vaporizing" oil burner. Complete boiler insulation reducing heat loss to minimum. Automatic draft regulator furnished. Outer cabinet in green, ripple, black trim. Drop door gives easy access to burner parts. Outside thermometer.



The QUINCY STOVE MFG. CO.

QUINCY, ILLINOIS



At 40° Below in Alaskan Fighters' Huts

MONOGRAM VAPORIZING BURNERS are proving their post war possibilities for you!

Heating men have always known that Monogram Turbulent Flame Vaporizing Burners provided the highest possible operating efficiency. Today Monogram Burners are again proving their superiority by keeping our Arctic fighters' huts warm at temperatures ranging down to 40° below!

Monogram's exclusive engineering achievement which converts oil to gas and mixes the gas with air before combustion produces a flame that is hotter, cleaner, tops in efficiency. It is a gas flame made from oil with all the high burning qualities of gas.

In your post war planning, make a prominent place for Monogram Oil Burners, Winter Air Conditioners, Booster Gravity Units, Room Heaters, Hot Air Heaters and the complete Monogram line.

Write for details to help you plan your post war selling program now.

The QUINCY STOVE MFG. CO.

QUINCY, ILLINOIS



LOCKFORME LOWERS SHOP COSTS

INSURES BIGGER PROFI

THE TOCKFORMER

CHICAGO,

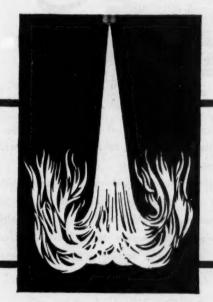
Read why G-E dealers will be in position to get a bigger share of Post-War Heating Business

Post-war demand for heating equipment—both for replacement and in new construction—promises to be great, as you know. And an important share of this biggest-in-history market will be available to G-E dealers.

Why? Because G-E dealers will have a powerful and exclusive sales advantage—derived from General Electric research and wartime experience.

For research is the mother of advancement, and General Electric's research years are long... its research facilities vast... its research staff skilled as few are in this field.

Out of such research will come the improved G-E heating units of tomorrow... easier to install, more compact, quieter, more efficient... designed to give the alert dealer opportunities for faster turn-over and bigger profits. General Electric Company, Heating Division, Section 4531, Bloomfield, New Jersey.



THE FAMOUS DOWN-JET . . . assuring more complete combustion, making more efficient use of every heat unit . . . was a research development that brought new comfort, convenience and economy to thousands of owners of pre-war General Electric heating equipment. Out of current research will come equally important dealer and owner advantages in the G-E heating units of the future.

T BUY WAR BONDS

GENERAL & ELECTRIC

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays, 10 P. M., EWT, NBC..."THE WORLD TODAY" News, Every Weekday, 6:45 P. M., EWT, CBS

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The tools and machinery in your shop are worth every care you can give them. For the longer they serve you, the more steel and manpower will be made available for the tools of war that are needed on the fighting fronts.

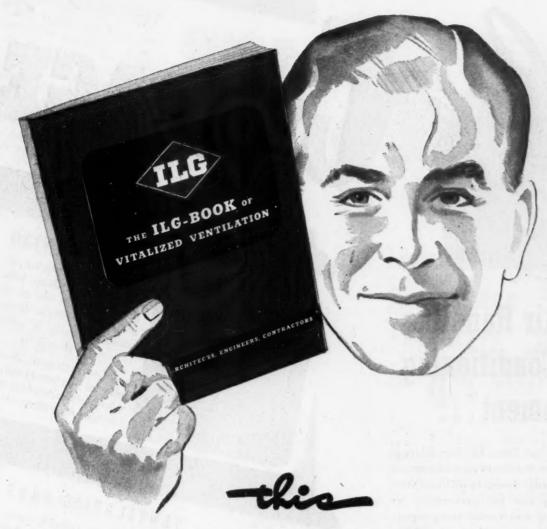
There are three simple, yet highly important, things you can do to prolong the life of your present equipment: regularly oil or grease all moving parts; sharpen the cutting edges when they become dulled or accidentally nicked; use your tools and machinery only within the limits of their rated capacities. The careful observance of these suggestions will not only minimize repairs and replacements, but will also enable your

men to do better work, faster, because the equipment will be in better working order.

When any of your shop tools do reach the irreparable stage or you need additional equipment because of increased business, OSBORN will gladly work with you in obtaining the necessary items. This has been an important part of our service to the sheet metal trade for many years.

OSBORNO CLEVELAND, OHIO BUFFALO + CINCINNATI + DETROIT

A DEPENDABLE SOURCE OF SUPPLY FOR 85 YEARS



AS I opened those covers, I was a little skeptical. But when I saw those sketches and precautions to be taken when designing or installing propeller fans or blowers, I started to sit up and take notice. Here were new ideas and practical information that I needed and could use on my job!

And then . . . when I came to those

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dozens of typical installations, in all kinds of buildings—apartments, stores, homes, factories, etc.—well indexed and complete with photos and drawings, I said to myself "Hank, here is a swell work-book. It's going to be right at my elbow from now on!" And that's where it is now!

So I'm passing this tip on to you. If

you have anything to do with the layout, installation or operation of ventilating systems...get this 88-page "ILG-Book"! It's priced at \$1.00, but you can get it free if you fill in and attach coupon below to your company letterhead. Or consult your classified directory and phone ILG's nearby Branch Office!



AIR CHANGE ... NOT JUST AIR MOVEMENT!

ILG ELECTRIC VENTILATING CO., CHICAGO 41
2871 North Crawford Avenue, Offices in 38 Principal Cities

ATTACH COUPON TO YOUR LETTERHEAD - MAIL TODAY

	Send	FREE	сору	of	new	"ILG-BOOK"

Individual

City

AMERICAN ARTISAN, January, 1944



For Air Handling and Conditioning Equipment . . .

Today, as since Pearl Harbor, Clarage is playing an important part in meeting the enormous demands of industry, shipbuilding and the government for air handling and conditioning equipment.

Tomorrow, after Victory, our long pre-war experience, plus notable research and manufacturing advancements born of war, will prove exceedingly profitable to those with peacetime requirements.

If you have an immediate and waressential problem, look to Clarage NOW for equipment expertly designed and built to your particular job and for prompt deliveries.

If you are thinking in terms of post-war service, look to Clarage NOW for any desired planning and cost-determining assistance.

Thus, when the time comes, your installation may be completed without delay and may incorporate the latest improvements in air handling or conditioning technique and equipment.

*Shown are only a few of the many types of units and systems built by Clarage. Write for our catalog showing complete line.





Clarage Unitherm Unit Heaters are designed for service in factories, mills, etc. They deliver heat at high velocity spreading it uniformly over wide areas. Both floor (as shown) and suspended types are available.

Equipped with centrifugal fans, ball bearings, adjustable outlets, and with coils for pressures up to 200 lbs., these units effect important savings in both fuel and maintenance costs.



SMALL AREA HEATERS

For heating small factory areas, buildings where heat losses are concentrated around outside walls, offices, stores, etc., Clarco Unit Heaters are recommended. Built in horizonial (as shown) and vertical types for installation along side walls or at ceiling level.

Unique design of propeller fan assures maximum heat delivery. Motor is totally enclosed, rubber mounted. Units are finished in red and black enamel—strikingly attractive. They are very quiet running.

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BOOSTER FANS

This is a complete line of small centrifugal fans for use in connection with warm air jobs, and as blowers in "package" air conditioners and in central station residential air conditioning.

Capacities 200 to 5000 c.f.m. Quiet operation an outstanding feature.

Units are furnished as complete fans (with or without inlet boxes), or wheels only or wheels and housings can be supplied. Also built as duplex units.



EXHAUST FANS

Clarage Exhaust Fans are made to cover all kinds of exhaust, blow pipe and pneumatic conveying requirements; used for dust collecting, removing fumes, and for conveying through pipe such materials as shavings, grains, etc.

Fan wheels are statically and dynamically balanced. Famous Clarage dust-proof, oil-light bearings standard equipment.

Smaller sizes adjustable for 8 different directions of discharge.





To be of maximum help to architects, engineers, contractors, industry and the government, Clarage maintains branch offices at all the strategic points indicated on the map above.

Each Clarage branch office is manned by experts - by Clarage engineers long experienced in satisfactorily meeting air handling and air conditioning requirements of every conceivable kind.

Whether you have a war-time or post-war problem, you will find Clarage application engineers eager to cooperate - and you will like the prompt, intelligent way in which your inquiry is bandled.

For such service, either dial our number in your city, or phone or write the factory at Kalamazoo.

CLARAGE FAN COMPANY Kalamazoo, Michigan



CHICAIC CONTRACTOR OF STEEL PRESS BRAKES

SPEEDY, precise, efficient production that will assure more ships, planes, tanks, guns and their accessories is what we all are striving for on today's War Production Front.

Yes, this ever-increasing production means many shops and plants must make equipment additions to keep the ball rolling . . . and that's where CHICAGO Steel Press Brakes do their part to perfection.

Ruggedly constructed to assure long-life and trouble-free service, they do their given tasks, quicker, better and more efficiently. Made in sizes to handle steel sheets from 4 to 20 feet in width, and incorporating many exclusive features in design and operation, they will fit into your shop, solve your particular production problem . . . and reduce operating costs.

Save Time . . . the most important factor in the war effort with D & K CHICAGO Steel Press Brakes . . . prompt deliveries can be made for all war requirements. Full information and catalogue will be sent upon request.



CHICAGO—Series D Steel Press
Brake has exclusive non-deflecting bed, automatic friction brake, and automatic ailing systems. Sizes 4 to 20 ft. capacities up to 5%" plate.

Standard and Heavy Duty Series . . . handles sheets from 37" to 72", cushioned-type clutch, zerk-alemite lubricating systems, quick adjustment features, variable speed drive, compact, sturdy constructions.



Also Remember

CHICAGO Hand Bending Brakes of all Types



Standard hand brake, one-man operation.

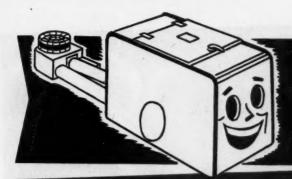
Portable hand brake. Light weight, maximum strength, powerful clamping.

Box and Pan Brake. Adjustable and removable fingers permit any size box or pan to be formed.

Adjustable Double Brake for forming two bends at one setting.

DREIS & KRUMP MANUFACTURING CO.

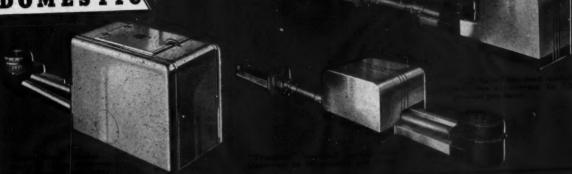
7404 LOOMIS BOULEVARD · CHICAGO, ILLINOIS



WE'LL ALL BE BACK ... AFTER THE WAR

TO SELL FAST AND STAY SOLD!

DOMESTIC



COMMERCIAL

autog sys-plate:





ECON-O-COL CDAL BURNER

THE SHIELD OF QUALITY

The "Stronghearted" Stoker

CORPORATION * ROCKFORD, ILLINOIS



The one thing above all others which makes "Detroit" Filters so efficient is the design. The incoming dirt-laden air scrubs along the walls of the cellular inlet passages, is given an abrupt change of direction, like this , then scrubs the walls of the outlet passages, and emerges, clean and dustless. Thus, dirt is deposited throughout the entire depth of the filter, not merely on the surface. That's why "Detroit" Filters have such low resistance to air flow.

The fibre passages are impregnated with non-dripping and odorless adhesive which catches the dirt. This dirt soaks up the adhesive, and in turn becomes the dirt catcher. That's why "Detroit" Filters maintain their efficiency for so long a time.

All the passages are uniform in size and shape. There are no dense and no comparatively empty spots. Thus the air flow is distributed evenly throughout the entire Filter. That's why "Detroit" Filters do such a thorough job of cleaning all the air.

THAT'S WHY DESIGN MAKES "DETROIT" AIR FILTERS SUPERIOR



Replacement filter business is profitable. Sell your customers "Detroit" Air Filters now.

An attractive envelope stuffer is available imprinted with your name. If you want some to send out to your customers, drop us a line on your letterhead.

Check these features:

- **▼ ECONOMY** Patented cellular design gives more filtering capacity per dollar.

 ✓ FREE AIR FLOW—Uniform
- air distribution assures free flow with maximum filtering.
- **▼ DUST CAPACITY**—Thoroughly impregnated with special nondripping compound to retain dust collecting ability indefinitely.
- **▼ ODORLESS**—Adhesive material is absolutely odorless and will not turn rancid.
- LONG LIFE Entire thickness of filter used in cleaning, thus providing long and efficient filtering.
- *STRENGTH-Selected materials and sturdy construction prevent sagging. No danger of small particles being carried into air
- ▼ POLLEN—Highly effective in providing relief for persons allergic to air-borne pollen.
- CLEANING Guaranteed factory cleaning and renewal ser-vice when necessary—a further economy.

 *No critical materials are used in the construction of "Detroit" Air Filters.



DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Division of AMERICAN Radiator and "Standard" Sanitary Corporation
Cosadian Representatives—Radiway and Engineering Specialities Limited, Montreal, Toronto, Winnings

Take a Look at TOMORROW- Joday!

"This Century Motor contributes a lot to the comfort of air conditioning."

Dependable CENTURY MOTORS Provide Quiet Starting and Quiet Operation for

Blowers and Fans

erating, and running of Century specialized motors for fans and blowers is one of the features that contributes to greater customer satisfaction. Among the other advantages of Century Motors are these: unusual freedom from mechanical and electrical vibration, Century's unique bearing bumpers that reduce chatter from V-belt irregularities, and cushion base mountings (available on motors of 3 horsepower and less) that isolate any possible vibration from your installation.

Century offers a wide range of specialized motors for not only blowers and fans, but also unit heaters, compressors, pumps—in fact, any heating, cooling, or ventilating application. They are available from fractional to 600 horsepower, in frames and electrical characteristics to meet the demands of every job.

For today—and tomorrow, investigate Century Motors for all your requirements.

CENTURY ELECTRIC COMPANY

1806 Pine Street, St. Louis 3, Missouri
Offices and Stock Points in Principal Cities

Century Electric Company, 1944



1944



Food box for hungry guns

On U. S. training grounds, in tropical foxholes and under the brooding fogs of the Aleutians, American soldiers are scooping hundreds of thousands of bullets out of ammunition boxes like the one shown above.

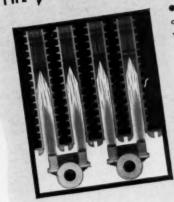
These sturdy field-gray containers are just one item in an almost endless list of items made for the Army from sheet steel. Bethlehem is producing large tonnages of sheet steel at top speed for ammunition boxes, mess kits, field kitchens; for bomb fins and shell windshields; for jeeps, trucks, combat vehicles, and many another piece of military equipment.



FURNACES AND HEATING UNITS

INCORPORATING EXCLUSIVE, TIME-PROVEN BURNER AND HEAT TRANSFER PRINCIPLES SUCH AS:

THE "Mutti-Thermen HEATING TUBE



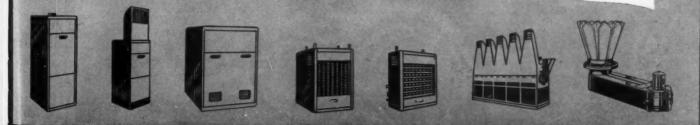
nd hint.

944

• The Janitrol Multi-Thermex heat exchanger utilizes a new principle in which each burner flame is directed into its individual tube of a battery of heat exchanger tubes. This eliminates the undesirable features of the old combustion chamber principle in which all the gas is burned in a large chamber before it is discharged through heat exchanger tubes. With Multi-Thermex—heat from the burned gases immediately comes in contact with the areas for heat transfer and is rapidly conducted through the tube walls to be wiped off by the circulated air stream.



The unique design of the Janitrol Amplifire
burner permits the products of combustion to
be directed into the Multi-Thermex heat exchanger tubes. These cast iron Amplifire
burner heads have accurately milled slots
into which are welded a series of alloy strips
to form the burner ports. They are grouped
together and welded in place in the milled
slot of the burner head, thus forming a mass
of tiny, deep ports. The patented, alternate
corrugated and flat sections of the alloy
traction. The result is a clear blue, ribbonlike flame having a long range of turn-down
combined with quiet operation.



SURFACE COMBUSTION . TOLEDO, OHIO

Janitrol Time-proven GAS-FIRED







WINTER AIR CONDITIONER • MODEL FAC

The Janitrol Gas-Fired Winter Air Conditioner for residential installation is offered in a complete range of sizes to handle requirements of from modern bungalows to large homes. The larger units also have found wide acceptance in commercial usage. Features include "Thermo-Drip Humidifier," "Multi-Thermex" principle of heat exchange, "Amplifire Burners," large capacity blowers and replaceable filters.

Catalog		Overall Dimensions (Inches)			Rating Stu.—Hr.	
Number	Front (Width)	Side (Width)	Height	A.G.A. Input	A.G.A. Output a Bonnet	
FAC 60-14	181/4	27	58	60,000	48,000	
FAC 90-14	223/6	27	58	90,000	72,000	
FAC 105-14	241/2	27	58	105,000	84,000	
FAC 120-14	273/6	30	58	120,000	96,000	
FAC 150-14	341/8	30	58	150,000	120,000	
FAC 180-14	423/4	30	58	180,000	144,000	

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WINTER AIR CONDITIONER • MODEL FCS

Janitrol FCS-24 Series Gas-Fired Heating Units as now used in hundreds of War Housing installations are the ultimate in low cost-compact -heating units for this type of work. Built as they are to meet the most rigid of specifications they still use a minimum amount of vital materials and as a result more heat per pound of weight is obtained than with ordinary equipment. FCS-24 Series Units are fully assembled and shipped in one crate.

Catalog	0.	verall Dimensio (Inches)	mi	Bating !	Btu.—Hr.	UA UA UA
Number	Front (Width)	Side (Width)	Height	A.G.A. Input	A.G.A. Output at Bonnet	Blowe o del
FCS 60-24	181/6	26	487/8	60,000	48,000	ole w
FCS 75-24	181/4	26	487/8	75,000	60,000	he B mende ories
FCS 90-24	241/6	27	511/8	90,000	72,000	compo

THERMO-ATTIC FURNACE • MODEL BACA

For basementless homes or where headroom is not sufficient, the Janitrol Thermo-Attic is ideally designed. Heat in winter-ventilation in summer, with a definite saving in floor space, chimney length and duct work are possible through this blower driven unit, installed compactly in the attic. This space saving unit is equally adaptable to certain industrial and commercial properties.

	0	rerall Dimensia (Inches)	ms .	Rating 1	Bru.—Hr
Catalog Humber	Front (Width)	Side (Wiath)	Height	A.G.A. Input	A.G.A Output Unit
BACA 75-14	185/8	343/8	34	75,000	60,00
BACA 105-14	24%	34%	34	105,000	84,00
BACA 125-14	273/8	34%	34	125,000	100,00
BACA 225-14	28	481/4	47	225,000	180,00

GRAVITY FURNACE • MODEL GAC

This type, the Janitrol Gravity Furnace, utilizes the gravity principle instead of forced circulation. Horizontal air flow principle assures maximum Btu. output. Equipped with complete automatic controls, this furnace meets the requirements and refinements of winter comfort. The compactness of the GAC makes it perfectly suited for basements with low ceilings yet allows for proper duct design.

GRAVITY AND THERMO-ATTIC FURNACES

	0,	eralt Dimension (Inches)	ns.	Rating	Btv.—Hr.	tions.
Catalog Number	Front (Widsh)	Side (Width)	Height	A.G.A. Input	A.G.A. Output Benne	pled wi and ki great s ductive
GAC 66-14	221/8	41	411/2	66,000	52,80	range o
GAC 88-14	30%	41	411/2	88,000	70,40	750,000
GAC 110-14	373/4	. 41	411/2	110,000	88,00	units. I
GAC 132-14	44%	41	411/2	132,000	105,60	hour, p
GAC 154-14	513/4	41	411/2	154,000	123,20	both du diffuser

The Janitrol units shown on these two pages are equipped with Multi-Therm

EDFURNACES AND HEATING UN



UNIT HEATER • MODELS UAS and UAC

anitrol Gas-Fired Suspended Unit Heaters are self-contained heating plants circulating arge volumes of heated air. The unit is uspended overhead, directing warm air lown to the space where heat is most use-

C

Btu.-Hr.

A.G.A. Output

48,000 72,000 84,000 96,000 120,000 144,000

48,000

60,000

60,0

100,0

88,0

105,6 123,2

-Therm

ful. Thousands of industrial, commercial and military installations are testimony to the Janitrol Unit Heater's popularity. UAS and UAC series have direct connected propeller type fans.

Catalog		Overall Dimensions (Inches)		Rating	Btu.—Hr.
Number	Front (Width)	Side (Width)	Height	A.G.A. Input	A.G.A. Output
UAS 50-14	161/2	211/2	257/6	50,000	40,000
UAS 65-14 UAC 65-14	191/2	223/4	273/8	65,000	52,000
UAS 85-14 UAC 85-14	. 221/2	237/8	30¾	85,000	: 68,000
UAS 100-14 UAC 100-14	251/2	251/6	301/4	100,000	80,000
UAS 125-14 UAC 125-14	281/2	251/6	33	125,000	100,000
UAS 175-14 UAC 175-14	24	321/4	34	175,000	140,000
UAS 200-14 UAC 200-14	281/2	321/4	34	200,000	160,000
UAS 225-14 UAC 225-14	281/2	331/2	34	225,000	180,000

UNIT HEATER • MODELS BAC and DUCT

lower Unit Heater: Where it is necessary o deliver air at higher velocities than possile with propeller type fan, and to deliver neated air against greater static pressure, he Blower Unit Heater (BAC-14) is recommended. Typical installations are in facories and commercial establishments. Sizes comparable to UAS and UAC above.

Duct Heater: These units are for duct installations on heating or air tempering jobs where air is circulated by a blower system. The DUCT-14 is less fan, motor, brackets, louvers, fan control, casing and fan guard but provided with wind tunnel or casing to which can be attached rectangular inlet and outlet ducts. Sizes comparable to UAS, UAC,

UNIT HEATER • MODEL FACE

anitrol Floor Mounted Unit Heaters, similar in construction and eatures to the FAC Series are deal for stores, halls and commercial buildings demanding a uper-service kind of heating that can be supplied only by a blower

A.6.A ype of floor heater. Efficient air distribution is accomplished by means of the Adjustable Air Difuser. If desired, duct work may e attached to the top of unit and warm air grilles or registers placed in suitable locations.

Catalog	Ov	Overall Dimensions (Inches)			Rating Stu.—Hr.	
Number	Front (Width)	Side (Widsh)	Height Including Diffuser	A.G.A. input	A.G.A. Output at Bonnet	
FACF 60-14	181/4	27	90	60,000	48,000	
FACF 90-14	221/8	27	90	90,000	72,000	
FACF 105-14	243/8	27	90	105,000	84,000	
FACF 120-14	273/6	30	90	120,000	96,000	
FACF 150-14	341/4	30	90	150,000	120,000	
FACF 180-14	423/4	30	. 90	180,000	144,000	

HEAVY DUTY UNIT HEATER • MODEL BBC

The Janitrol Heavy Duty Floor Mounted Unit Heater is ideal for airplane hangars, tempering of ventilating air, large erecting floors, warehouses, shops and all large space heating applicaions. Its extreme simplicity coupled with adaptability to all types and kinds of buildings effects great savings of valuable, productive floor space. Complete range of sizes and capacities is possible. Janitrol BBC-24 utilizes sectional construction up to 1,-750,000 Btu. or larger in multiple units. Each sectional unit has an input rating of 250,000 Btu. per nour, per section. Adaptable to both duct work and directional diffuser outlets.

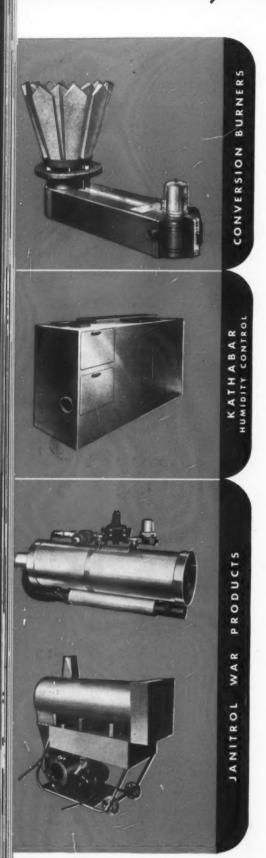
		Over	rell Dimersi (Inches,	ions	Rating Btv.—Hr.	
	atalog lumber	Frant (Width)	Side (Width)	Height Including Herries	A.G.A. Input	A.G.A. Output
BBC	250-24	2' 31/4"	38"	1081/2	250,000	200,000
ввс	500-24	4' 63/4"	38"	1081/2	500,000	400,000
BBC	750-24	6' 101/4"	38"	1081/2	750,000	600,000
BBC	1000-24	9' 11/2"	38"	1081/2	1,000,000	800,000
BBC	1250-24	11' 41/4"	38"	1081/2	1,250,000	1,000,000
BBC	1500-24	13' 81/4"	38"	1081/2	1,500,000	1,200,000
BBC	1750-24	15' 11%"	38"	1081/2	1,750,000	1,400,000

Heat Exchangers and Amplifire Burners as described on front cover.

MODEL UAS & UAC HEATERS SUSPENSION MODELS MODEL DUC MODEL BAC HEATERS MODEL FACE FLOOR MODELS

MODEL BBC

Uanitrol Time-proven (GAS) FURNACES AND HEATING UNITS



JANITROL CONVERSION BURNERS

A wide range of capacities, sizes and shapes is offered in Janitrol Conversion Burners for every round or rectangular pot. Clean, completely automatic gas heat can thus be had in present boilers and furnaces. Push button lighting, finger-tip control and Janitrol leaning-overlapping baffles are a few of the features that have made these units widely accepted in modera conversion to gas heat.

Kathabar System for HUMIDITY CONTROL

A simple accurate method of humidity control and air conditioning for hundreds of industrial and commercial applications has been made possible by Kathabar System. The Kathabar System is complete, compact and will dehumidify, or humidify, in accordance with the need to maintain the desired percentage of air moisture. Kathabar performs this dual function of balancing air moisture as a single automatic operation, independent of air temperature. Sizes from the new Package Units starting at 750 c.f.m. to large, specially designed central systems of 100,000 c.f.m. give the designer a complete selection from which to choose.

KATHABAR PACKAGE UNIT DATA

Medel He.	Capacity c.f.m.	0	verall Dimension (Inches)	11	Unit Weight
		L	w	н	Pounds
75	750	48	30	78	1600
150	1500	62	30	78	2000
350	3500	941/2	42	82	3500
500	5000	1071/2	49	84	4800

JANITROL WAR PRODUCTS

While regular residential Janitrol Gas-Fired Winter Air Conditioning equipment has not been fully available during the war, the facilities and engineering skill of Surface Combustion have by no means been idle. Many products for war use have been manufactured in large quantities. With the years of experience in heat and heating problems it is natural that Surface Combustion's contributions to the war effort would be along this line. Surface Combustion has been producing:

The Janitrol Aircraft Heater for cabin heating; cockpit warming; foot warming; windshield and all glass surface anti-icing, defrosting and defogging; wing and empenage anti-icing; engine warming; gun breech heating; heating of cameras, bomb sights, automatic pilots and instruments; cargo and transport—sick and wounded space heating.

The Janitrol Portable Ground Heater for aircraft engine, cockpit and cabin warming on ground; heating field hospital tents, headquarters tents, assembly tents, etc.; preheating engines, cockpit and cabin of amphibian planes; ice removal from ships, docks, wharves, etc.; heating mobile truck repair units; to prevent freezing of perishable goods during loading and unloading or while in temporary storage; for temporary, localized heating in unheated warehouses; to supply heat for concrete mixing or to prevent concrete freezing during severe weather; thawing frozen rolling equipment treads, brake drums, radiators, etc.; emergency heating of barracks, etc., during heating plant outages; miscellaneous heating on tank and automatic equipment and repair depots; man heating on outdoor labor during sub-zero weather and localized heating in shipyards, factory yards, and other locations beyond the limits of regular heating systems.

Many developments have been made along this line by Surface Combustion with consideration of peace-time applications. As an example, the Janitrol Portable Heater should find much use on construction projects wherever heat is necessary or heating during construction, before the permanent heating system is installed, keeping material stock piles above freezing point, etc.

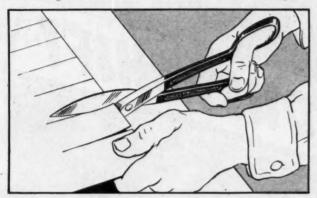
For further information on Janitral equipment ask for specification sheets giving complete engineering data.

SURFACE COMBUSTION • 18458

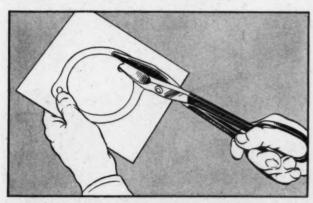


No. 17 PICKING THE PROPER TOOL FOR THE JOB

There is a difference in snips. They vary in style and size in order that they may better handle a wide range of cutting work. Below are some common examples.



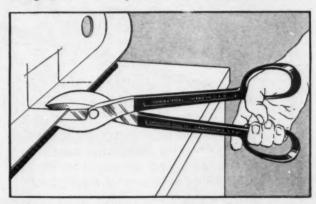
For general cutting use, STANDARD PATTERN CRESCENT SNIPS are recommended. Made in 8 sizes, they are designed to cut straight lines or circles of fairly large radius. Example: Cutting sheet metal to size.



Where it is necessary to cut intricate patterns or curves of small radius, use CRESCENT CIRCULAR CUTTING SNIPS. The curved contour of their cutting edges makes it possible to turn the cut sharply without taking a new "bite." Example: Cutting intricate templates.



When "on-the-job" work will not permit an assortment of snips being carried, us? CRESCENT COMBINATION SNIPS. They are or signed after conventional circular cutting types and will cut curves as well as straight lines. Example: Hot air furnace work.



Where powerful leverage is necessary, as with heavy sheet metal, CRESCENT HEAVY DUTY SNIPS—with an overall length of 16¼ inches—are ideally suited. Example: Heavy bench work.

MAIL THE COUPON FOR FREE REPRINTS

This is No. 17, in Crescent's TOOL NOTES Series. These informative advertisements providing practical information for users of hand tools, are available either punched to fit a standard 3-ring binder or suitable for bulletin board and classroom use. Coupon request will receive prompt attention.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.



Crescent Tool Co., Jan	nestown, N. Y. H-
Please send your "	TOOL NOTES" Series
for Bulletins	for 3-ring binder
Name	
Address	

HIO





AMERICAN AIR FILTER COMPANY, INC., 355 CENTRAL AVE, LOUISVILLE, KY.

IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.



Hydraulic-Action **Space Thermostats**

White-Rodgers Space Thermostats provide un-usually close control where temperature change is rapid. Ideal for unit heat-ers, coolers, etc. Remote-bulb types available to con-trol duct temperatures for heating and air condition-ing. Series 200.



Commercial Refrigeration Applications

Hydraulic-Action control for use in quick-freeze cab-inets, meat and vegetable display cases, walk-in cab-inets. Range -20° to +50° F. Adjustable differ-ential 3° to 25° F. Series 1600.



Surface Hot Water **Limit Control**

ixed and adjustable-differ-ntial types are available - suitable for either line rlow-voltage installation. wenty-inch surface con-act of Hydraulic-Action lement assures quick re-ponse. Easily installed. eries 1100.



Room Thermostat

Heavy-duty line-voltage room thermostat with uni-formly calibrated dial for use on unit heater and air-conditioning installations. No relay necessary on most installations. Series 150.



Combination Fan and **Limit Control**

For use on forced warm-air For use on forced warm-air heating systems requiring accurate fan control and positive limit protection. Hydraulic-Action, no tem-perature drift. Flush mount-ing because of flexible Hydraulic-Action element. Range 70° to 250° F. Series 500.

File: Planning Lemperature control

In your plans for the future you will undoubtedly face many problems in temperature and pressure control. Their solution will be found in the accurate, dependable performance of White-Rodgers Controls.

Where positive control is necessary, the White-Rodgers Hydraulic-Action principle will fit every application. For the success of your plans for tomorrow investigate the advantages of White-Rodgers Controls today!

WHITE-RODGERS

ELECTRIC CO.

1215A Cass Ave.



Selective-range low-side pressure control with lever essure control with lever of total range may be selected by the installer to permit adjustment by the user. Series 1500.

4 4



Diaphragm Gas Valve

Diaphragm valve with built-in Hydraulic-Action mechanical limit control combined into one easy-to-install unit.



Solenoid Gas Valve

High plunger pull — no hum. Types for line or low voltage.



Steam Limit Control

essure-operated with ap-action line or low tage switch. Differential astant over entire range, librated, easy-to-read sl with key or screw-ver adjustment. Series



St. Louis, Mo.

110 m Explosion-Proof Thermostats الديمالت

White-Rodgers Explosion-Proof Thermostats are line voltage Hydraulic-Action controls especially de-signed for locations where hazardous conditions exist. Underwriters approved.



Stoker Timer

Dependable White-Rodgers line-voltage stoker timer incorporating slow-speed synchronous motor with sealed-in life-time lubrica-tion. Also available with fused-line switch.



1944

Immersion Hot Water Control

Single-immersion circula-tor or limit control with vertical well. Highly re-sponsive hydraulic element. Single-pole, double-throw switch action. Dual-immer-sion types are also avail-able. Series 1100.



Heat Anticipating Thermostat

Trim, modern low-voltage room thermostat with Touch Temperature Ad-justor and visible recessed thermometer. Attractive finish in ivory with chrome trim. Series 130.





HERMAN NELSON products which are now at war will again be used to heat and ventilate all types of public, commercial and industrial buildings when the peace has been won. Architects, engineers and contractors will again select Herman Nelson equipment to provide proper air conditions for the pupils, the customers, the workers and the other occupants of these buildings.

The products which gave such reliable service before the war will be available with improvements developed since that time. In addition, several products have been produced since the war started which will find new application when available for civilian use.

When designing post-war projects, architects and engineers will find that Herman Nelson products fulfill their heating and ventilating requirements.



THE HERMAN NELSON CORPORATION

MANUFACTURERS OF QUALITY HEATING, VENTILATING AND AIR CONDITIONING PRODUCTS

MOLINE, ILLINOIS

Herman Nelson Unit Ventilators have been providing proper air conditions for school children throughout the world for twenty-five years.



* When you buy hand tools ask for



W. A. WHITNEY



No. 1 Punch

Capacity 3/8" hole through 1/4" iron Length 34". Wt. 23 lbs. Depth of throat 174".

Punches and dies 1/8" to 9/16" by 1/64"



No. 2 Punch

Capacity 5/16" hole through ½" iron
Length 23". Wt. 14 lbs. Depth of throat
1-11/16"

Punches and dies 3/32" to 1/2" by 1/64"



Channel Iron Punch

(A companion to No. 2 Punch)
Capacity ¼" hole through ¼" iron
Length 23". Wt. 17 lbs. Depth of throat

Punches and dies 3/32" to 1/2" by 1/64"



HERE'S WHY-

There's a Whitney tool for every job, and every tool has these 6 Important Features—

- Simple Design
- Sturdy construction for hardest kind of service
- Well distributed weight, making tool easy to handle
- Drop forgings of high grade alloy steel on all main parts
- · Heat treated wearing parts
- Guarantee against defect in material and workmanship

Extra punches and dies are of A-1 grade tool steel, expertly heat trea*ed and tempered

The Registered Trade Mark



which appears on all W. A. Whitney tools and extra punches and dies is the manufacturer's promise that they will give entire satisfaction and the utmost in service.

Illustrated are a few Whitney Hand Lever Punches. Write for our catalog giving full information on all sizes and styles, or ask your jobber

Buy W. A. Whitney tools from your jobber



No. 4-B Tinner's Punch

Capacity ¼" hole through 16 gauge iron Length 8½". Wt. 3 lbs. Depth of throat 2" Punches and dies 1/16" to 9"32" by 1/64"



No. 6

Skylight, Ventilating and Tank Flange Punch (Especially adapted for button punching)

Capacity 1/4" hole through 3/16" iron

Length 261/2". Wt. 101/2 lbs. Depth of throat 13/4"

Punches and dies 1/8" to 9/32" by 1/32"



No. 8-B Punch

Capacity 1/4" hole through 1/8" iron

Length 181/2". Wt. 71/2 lbs. Depth of throat 2"

Punches and dies 1/16" to 7/16" by 1/64"





No. 92 Bench Punch

(Uses No. 91 punches and dies) Weight 165 lbs. Depth of throat 10"

No. 91 Bench Punch

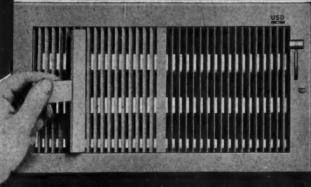
Capacity ½" hole through ¾" iron ¾" hole through ¾" iron 2" hole through ½" iron Weight 82 lbs. Depth of throat 5" Punches and dies ½" to 2"

Channel Iron

2½" Flange x ¼" Web Angle Iron 2½ x 2½ x ¼"



Avier Serves in Prepare War and Prepare for Peace



iron oat 2"

1/64"

Flange

on

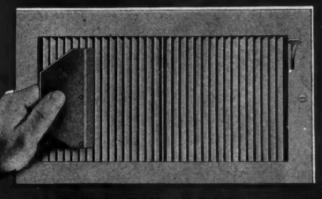
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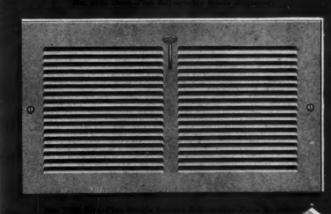
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1/64"

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After Pearl Harbor American industry was assigned a war production task of unparalleled magnitude. We are proud to have even a minor part in this activity—in our case the manufacture of aircraft and combat vehicle parts. We have also supplied quantities of registers and grilles for essential war-time projects, and for all purposes permitted by Federal regulations. For example, the vast new War Department Pentagon Building in Washington is equipped throughout with Auer registers and grilles, as are numerous low-cost housing groups, barracks and other units.

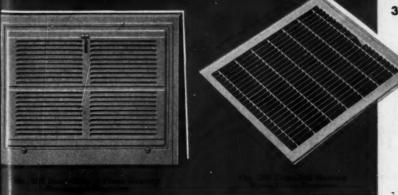
Meantime our factory equipment and staff have been preserved virtually intact, for the resumption of our regular line when the time comes. When normal conditions are restored, Auer will be ready to supply its thousands of friendly customers with registers and grilles for all heating and air conditioning purposes.

Latest catalog on request

THE AUER REGISTER COMPANY

3608 Payne Avenue

Cleveland, Ohio



AUER Registers and GRILLES

for AIR CONDITIONING and GRAVITY



THIS, TOO, IS YORK HEAT

MANY of our boys are far from the comforts of home, but not too far for an occasional hot shower. Keeping them and their clothing as clean and sanitary as possible is one of York's many war-time jobs. Portable showers and laundries, fired by York Oil-Burners, are busy continuously.

Mounted on truck-trailers, they follow our flexible, fast-moving, mechanized army across rough, battlescarred country. The oilburners, like the other equipment, must be light in weight, yet able to deliver dependable service in spite of rough going.

Meeting these requirements has meant a new kind of York Heat. You'll find it in the homes of tomorrow, delivering new economies in fuel - consumption . . . new coldweather living comfort . . . and an even higher degree of foolproof, automatic operation. Be sure to look into this new York Heat as soon as the war is over.

* Buy the things you want, tomorrow buy bonds to-

Division of YORK-SHIPLEY, INC.

York, Pa.



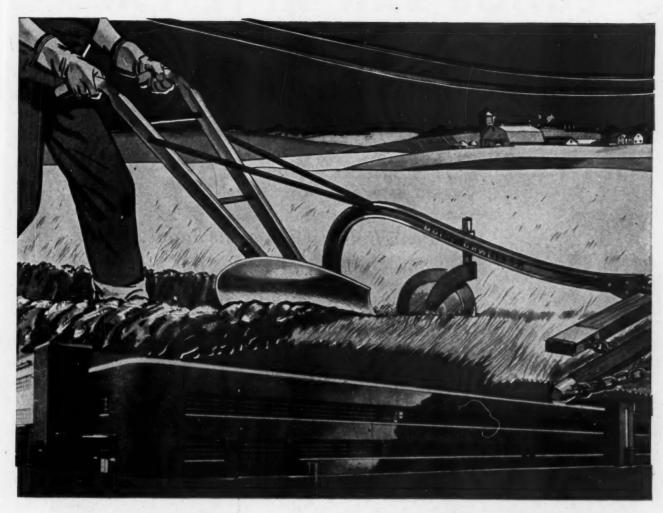
IS TURNED ON

Millions of messages on York Heat are being sprinkled over the United States and Canada every month. Hundreds of prospects right in your own home territory are being warmed-up to the advantages York Heat will have to offer when the flood of Deferred Demand is turned loose.

York Heat will have plenty of advantages, too. New standards of performance and new economies have been engineered into York Oil-Burners to meet the rigid requirements of war-time conditions. New designing now being worked out on the drawing-boards will incorporate these changes into the heat of tomorrow for the homes of tomorrow.



YORK-SHIPLEY, INC., YORK.



More than a quarter million dollars plowed back to American industry

by One Allen Ventilating Unit ...

Ventilation that does the job comes first with Allen. Close on the heels of that consideration comes lowered cost to the buyer. Only when we click on both are we satisfied, because only then do we know we've done the right kind of job.

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y, 1944

Basically better ventilation engineering has enabled Allen to furnish industry with more than four thousand Allen Type "H". Roof Fans at an average saving of \$62.50 per unit over the nearest comparable equipment—more than a quarter million dollars.

The explanation is simple. Allen patents

cover the use of dampers balanced in the effluent air stream—open when the fan is running, closed automatically when power is off. This is in contrast to construction used by several other manufacturers wherein mechanical, motor-operated dampers are mandatory and up the cost.

Approximately 400 of these Allen units top the huge Willow Run Bomber Plant, shown above. Allen has an answer for your ventilation problem, too, whether it's ordinary or extraordinary. Let's talk it over. The Allen Corporation, 9751 Erwin Avenue, Detroit 13, Michigan.

SOME TYPICAL USERS OF ALLEN TYPE "H" UNITS

BLACK AND DECKER BOWER ROLLER BEARING BUNDY TUBING COMPANY **EX-CELL-O CORPORATION** FISHER BODY DIVISION FORD MOTOR COMPANY GENERAL ELECTRIC COMPANY DES MOINES ORDNANCE PLANT TWIN CITIES ORDNANCE PLANT LOWELL ORDNANCE PLANT ACME COTTON PRODUCTS KEN-RAD CORPORATION BROOKLYN NAVY YARD MINNEAPOLIS ORDNANCE PLANT SERVEL, INCORPORATED A. C. SPARK PLUG GAR WOOD INDUSTRIES

THE allen

CORPORATION



NGINEERED VENTILATION FOR INDUSTRY

When the Heat of Battle Is Over And the Sailor is Home from the Sea

Penn Boiler will turn its hands toward another kind of heat—the kind that makes our homes warm and our hearts glad.

We are not unmindful of those days for which everyone is planning. Today, while we are making the weapons of war, we are planning too, for the time when we will again produce better Penn factory-assembled all-in-one heating units which will bring new comfort to thousands of homes.

Today, we are 100% in the War Effort; tomorrow we will be 100% in the Home Effort — When the Heat of Battle Is Over!



Penn Units Are All-In-One:

Boiler, burner, combustion chamber, circulator and domestic hot water supply. Because Penn units are factory-assembled and factorycoordinated, you can expect complete satisfaction.

PENN BOILER & BURNER MFG. CORP.

E. C. STAUFFER, PRESIDENT

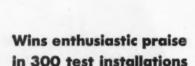
LANCASTER, PENNA.



THE NEXT ESSENTIAL

for the "Home of Tomorrow"

SERVEL'S NEW ACC-YEAR
GAS AIR CONDITIONER



"Couldn't do without it." "Best investment I ever made!" "We point with pride to our good fortune in having this equipment." These are typical comments received from people who helped test Servel's new All-Year Gas Air Conditioner.

Three hundred of these installations were made in nomes and certain types of commercial buildings throughout the country. Careful records of costs and results were kept, and frank opinions of users secured. In every case the verdict was the same . . . undreamed-of comfort all year round, at a surprisingly reasonable cost!

Servel's new All-Year Gas Air Conditioner is the result of nine years' engineering and research. One compact unit performs all six basic air-conditioning functions—cools and dehumidifies in summer, heats and humidifies in winter, provides air circulation and filtering the year round. It combines all the advantages of indirect-fired heating and absorption refrigeration, in one simple-to-operate complete air conditioner.

This new equipment will be available for your postwar clients just as soon as production capacity is released from war work. Write today for the full story about Servel's *All-Year* Gas Air Conditioner. Address: Servel, Inc., Evansville, Ind.

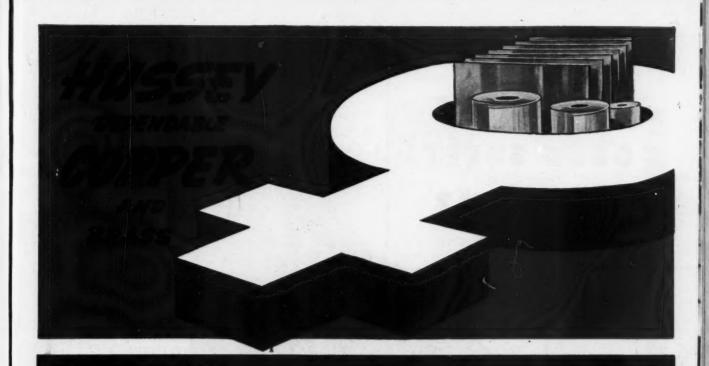
SERVEL GAS REFRIGERATORS are standard equipment in the nation's finest apartments.





SERVEL, Inc.

America's Leading Makers of Modern Gas Appliances



A GOOD NAME TO REMEMBER IN YOUR POST-WAR THINKING FOR THESE AND HUNDREDS OF OTHER SIMILAR APPLICATIONS

Agriculture Implements
Aircraft & Parts
Business Machines
Cars & Trucks, Industrial
Cars, Electric & Steam
Clocks, Watches
Communication Equipment
Dental Equipment
Electrical Equipment
Engines, Turbines
Firearms
Fire Extinguishers
General Machinery
Hardware

Heating & Cooking Apparatus
Instruments
Laundry Equipment
Lighting Equipment
Locomotives
Machine Tools
Mechanical Power Trans. Equip.
Mining Equipment
Motorcycles, Bicycles, & Parts
Motor-Vehicles & Parts
Oil Burners
Oil Field Equipment
Photographic Apparatus

Printing Machinery & Equipment
Pumps & Equipment
Radio & Phonograph Apparatus
Refrigeration & Air Conditioning
Safes & Vaults
Scales & Balances
Sewing Machines
Ship Building & Repairing
Soda Fountain Equipment
Stokers, Mechanical
Textile Machinery & Parts
Tractors
Woodworking Machinery
X-Ray & Therapeutic Apparatus

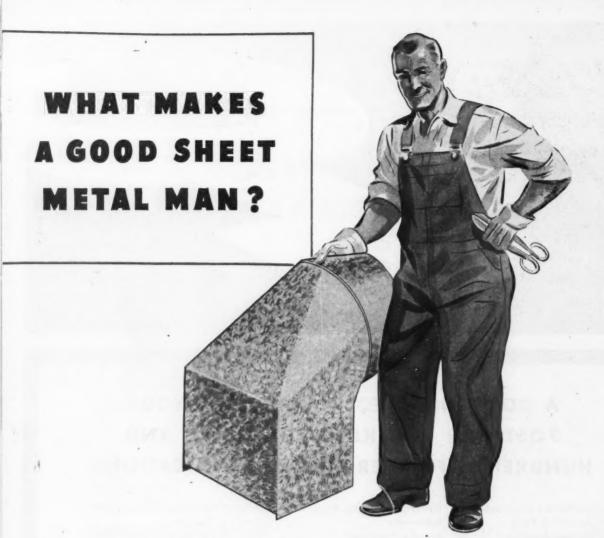
and hundreds of other similar applications where the corrosive action and easy workability and dependability of copper and brass are essential.

C. G. HUSSEY & COMPANY

(DIVISION OF COPPER RANGE CO.)

Rolling Mills and General Offices: Pittsburgh, Pa.
Warehouses in Principal Cities

, 1944



We know what makes a good workman in Superior's steel mills. Attitude, experience and training are mighty important, but these qualifications would be wasted without good tools and good materials to work with. The same is true in a sheet metal shop.

Take steel sheets, for example. If they have a high degree of workability, your work goes faster and easier. If the zinc coating is uniform and tenacious, difficult forming operations are simplified and you have a cleaner, better job when you are through.

Superior has long specialized in producing high quality galvanized sheets for the sheet metal trade. That we have succeeded in producing quality material is attested by the wide popularity of Superior trade-marked sheets. Ask your jobber about future supplies of Superior and Continental steel sheets.

THE SUPERIOR SHEET STEEL CO., CANTON, OHIO . CONTINENTAL STEEL CORP., KOKOMO, INDIANA











It's Ventilators like these that bring you that priceless asset-

CUSTOMER SATISFACTION

Install Swartwout Roof Ventilators in '44 for outstanding success in ventilating industrial and commercial buildings



THIS fully illustrated catalog describes the Swartwout Line of Roof Ventilators. Write for Bulletin 214 on your company letterhead. It takes a war to wake people up to a good many things. One of them is the need of good ventilation in making it possible for people to work at highest efficiency—in war plants and elsewhere. It's easier than ever before to sell modern ventilation. And Roof Ventilation is used on the largest scale.

Get set to handle Roof Ventilation contracts that build prestige and new contracts for you. The Customer Satisfaction you create with Swartwout Ventilators puts you in a position to enjoy continuing profitable business. Ask for details of the Swartwout line.

THE SWARTWOUT CO., 18511 Euclid Ave., Cleveland 12, Obio

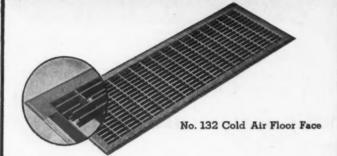
Swartwout VENTILATION SPECIALISTS

INDEPENDENT,

Familiated IREG U.S. PAT. OFFICE

FLOOR FACES
AND REGISTERS

The Independent line of "Fabrikated" floor faces and registers provides a complete group for all requirements. Send for catalog 41G which gives complete details.





★ INDEPENDENT BASEBOARD AND WALL REGISTERS WITH FLEXIBLE GRILLE BARS

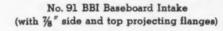


No. 92 Baseboard Register Two Piece Style — with Removable Grilles

No. 191 Sidewall Register



* INDEPENDENT RETURN AIR INTAKES WITH FLEXIBLE GRILLE BARS





ALWAYS LEADING—ALWAYS PROGRESSING

No. 91 RAI Intake



THE INDEPENDENT REGISTER CO.

3747 EAST 93RD STREET, CLEVELAND, OHIO



SOLDIER looks forward to a brave new world — a world where he and his family and friends can enjoy the comforts and conveniences that Victory will bring.

When that great day comes, WEIR-MEYER will be in the vanguard of the procession offering Heating Equipment of greater efficiency and comfort-giving convenience. Styled for the times, the new WEIR-MEYER Home Heating Systems will be leaders. Leadership is a habit with WEIR-MEYER.

Distributors and dealers who want to serve their communities profitably are getting facts about WEIR-MEYER now. Your inquiry will be welcomed.

BUY WAR BONDS TO SPEED VICTORY!



1944





HEAVY DUTY Equipment

The WEIR-MEYER highcapacity units now going into military, war housing and war plants, will be available for general industrial and commercial applications as soon as war needs are supplied.

The War Bonds you buy insure America's future. Keep on buying! leating Equipment for low-cost, healthful warmth. WEIR-MEYER leadership in forced-air engineering, air filtering, proper humidification has kept WEIR-MEYER ahead of the parade.

Thousands of installations for the Armed Forces have strengthened the well-earned WEIR-MEYER reputation for highestquality and finer performance.

TOMORROW . . .

In the highly industrialized world of tomorrow, the engineering skill and production lessons of today will bring even finer equipment bearing the WEIR-MEYER trademark.

There is no substitute for experience. That's one big reason for WEIR-MEYER superiority.



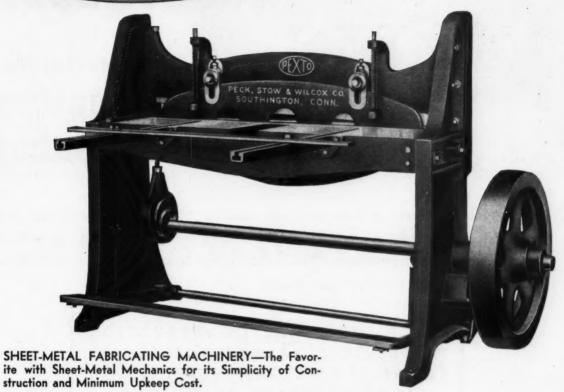
159 YEARS

Manufacturing

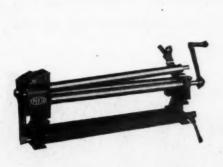
RESEARCH



SINCE 1785



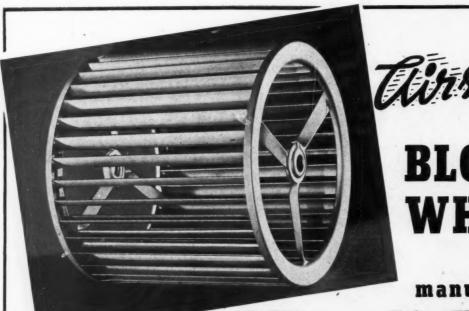
Catalog No. 35A Machines & Tools for Sheet-Metal Work.
Bulletin No. C10 Power Squaring Shears.







THE PECK, STOW & WILCOX COMPANY, SOUTHINGTON, CONNECTICUT, U.S. A.



Airstream

BLOWER WHEELS

for manufacturers

of Warm Air Heating and Air Conditioning

Every manufacturer whose products employ blowers will welcome the AIRSTREAM Blower Wheel — an outstanding advancement in the art of fan design and manufacture. The AIRSTREAM Blower Wheel is a definite stride forward in aerodynamic design.

ONE-PIECE BLADE CONSTRUCTION THREE - PIECE BALANCED ASSEMBLY EQUALIZED WEIGHT DISTRIBUTION 40-60% LIGHTER IN WEIGHT

AIRSTREAM Blower Wheels are furnished in standard diameters of 10", 12", 14", 16" and of a wide range of widths. Special diameters and widths can be furnished if required in large quantities.

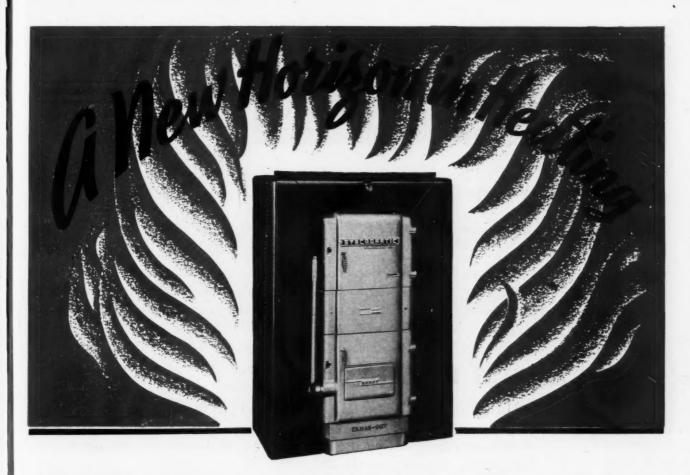
Engineering data upon request.

MORRISON PRODUCTS, INC.

EAST 168TH & WATERLOO ROAD

CLEVELAND, OHIO

MORRISON IS CONTRIBUTING TO VICTORY BY CONSERVING STEEL



By the Makers of Today's War Goods

When V Day comes, all America will turn to the job of building a better world.

The basic need in the world is effective health protection. Good heating affords this protection.

Your V Day will come when you can see the bright new

horizon of the post war world ... when you can offer to your customers the best and most modern in heating and air conditioning equipment.

Syncromatic is engineering that equipment for you today. Write now for the facts. Be "in the know" when the war ends!

Syncromatic Corporation

MILWAUKEE 12, WISCONSIN

MANUFACTURERS OF

Gravity - STEEL WARM AIR FURNACES - Forced Air

SOLD THROUGH LEADING JOBBERS - BUY WAR BONDS

y, 1944



Preparing for the FUTURE -while working for VICTORY

Although our production lines are working day and night on War material, our Engineering Department is also busy improving MASTER Heat Regulators (damper type) and developing new types of controls for the heating industry.

A NEW MASTER DAMPER MOTOR

This is one of the new MASTER products that will be ready to go into production as soon as War restrictions permit. It is really NEW—fills an important need in the heating field—and has demonstrated surprising efficiency in all tests.

A NEW MASTER Complete DAMPER CONTROL

This is another interesting MASTER development that will meet a profitable waiting demand when the National situation permits production.

Shipments on MASTER HEAT REGULATORS

(Damper Type A-23.) For the present, these are on an Allotment basis. As far as limited available production facilities and WPB restrictions will permit, we are doing the best we can to take care of our established customers on a fair and equitable basis.

The "MASTER" Promise to You

When PEACE comes, we shall be ready with a complete new line—new designs, new improvements, new products—a line you'll be proud to use and sell.

WHITE MANUFACTURING CO.

2368 UNIVERSITY AVE.

ST. PAUL, MINN.



AMERICAN ARTISAN, January, 1944

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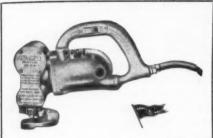
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ry, 1944

65



UNISHEARS Cut Sheet Metal Faster!



Stanley Unishear No. 214 — Cutting capacity 14 gauge bot rolled steel.

Stanley Unishears cut sheet materials as fast as you feed, up to 15 feet per minute — follow any line accurately, straight, curved or angle — leaving smooth, clean edges with no waste of material. Plenty rugged for tough production or maintenance use.

Portable Unishears are made in four models — for 18 gauge, 16 gauge, 14 gauge and 12 gauge hot rolled steel or galvanized iron. Stationary Unishears are also available to cut 14 gauge and 10 gauge sheets. Write for literature.

Stanley Electric Tool Division, The Stanley Works, New Britain, Connecticut. STANLEY

STANLEY UNISHEARS

Electrically Driven Metal Shears

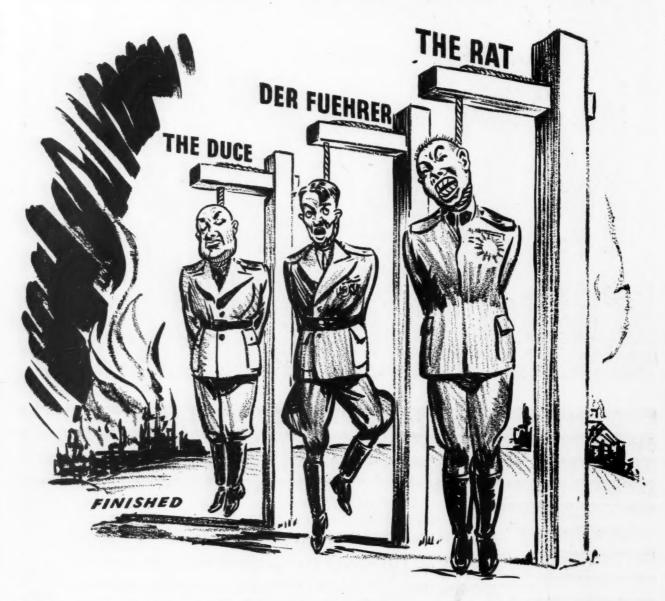




1944

(ONE DOWN --- TWO TO GO)

NOW--let's all pull together for a happy ending in 1944



THE WISE FURNACE CO. AKRON, OHIO

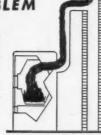


Now has finished its Fortieth Year serving its customers faithfully and satisfactorily



HERE'S YOUR PROBLEM

At right you see an average heating plant NOT equipped with a draft control. Because the chimney draft is greater than needed for proper combustion, valuable heat is drawn up the flue and wasted. A true picture nine times out of ten!



HERE'S YOUR ANSWER

With a Field Draft Control waste is ended. Barometric pressure opens the gate a precise distance, and all draft, excepting the minimum needed to carry smoke up the chimney is drawn off through the opening. Fuel savings range up to 25%1



1944

Bulley "CUSTOM BUILT"



Bayley "Ex" Exhaust Fans, custom built to meet the individual needs of industry, are without a doubt the most advanced, efficient and durable fans available. Built in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM capacity with pressures up to 15" W.G., they cover a wide range of applications in all types of industrial and war plants. Bayley "Ex" Fans are designed and constructed to operate faultlessly under the most adversed conditions . . . they can be made explosion proof . . . non-ferrous . . . and are produced in stainless steel to handle high temperature gases up to 1600° F. Bayley Blowers give assurance of lasting, trouble-free service . . . and will do your specific job better. Investigate their possibilities for your particular purpose NOW!

TYPICAL USERS OF BAYLEY PRODUCTS



Arrangement No. 1

Overhung blast wheel, pulley drive, regularly fitted with ring ciling bearings. (Ball bearing optional)

Allis-Chalmers Mfg. Company The American Monorail Company Armour & Company

The Borden Company
Briggs & Stratton Corporation
Carnegie Illinois Steel Corporation

Chrysler Corporation

Cleaver-Brooks Company
The Day Company

Despatch Oven Company

Diamond Iron Works, Incorporated And the Mahr Mfg. Company

Division

The Dow Chemical Company

Dravo Corporation

Ford Motor Company

Harnischfeger Corporation

The Heil Company

Marquette Cement Mfg. Com-

Nash Kelvinator Corporation

The Pennsylvania Railroad Com-

Phoenix Hosiery Company

A. O. Smith Corporation

A. E. Staley Mfg. Co. Swift & Company



Arrangement No. 4
Housing wheel and motor subbase only for direct motor drive.

BAYLEY BLOWER CO.

1817 SOUTH 66TH STREET

MILWAUKEE, WISCONSIN



, 1944



Both the Model 8 power-operated and the Model 06 hand-operated rotary shears incorporate the unique Quickwork rotary shearing principle. Ideal for general shop work, they cut straight or odd-shaped pieces equally well. Versatile and simple, these Quickwork models offer not only fast operation, accuracy, and

ease of handling, but also over-all economy.

Other Quickwork-Whiting Rotary Shears are available in a complete range of sizes to cut, bevel, circle, flange, and joggle plate and sheet metal from the lighter gauges up to 1" mild steel. With their various attachments, they are widely used in many industrial applications.

The Model 06 Hand-Operated Rotary Shear is light weight and easy to install. Handles close work, cuts short radii; deep 18-inch throat permits the handling of large sheets. Capacity 16-gauge mild steel.

The Model 8 Rotary Shear, only rotary shear with a variable speed drive, is the least costly, power-operated shear of its cutting capacity on the market. Capacity % inch mild steel.

Write for information.

QUICKWORK-WHITING DIVISION

CORPORATION

15699 NO. LATHROP AVENUE, HARVEY, ILL.

OTHER QUICKWORK-WHITING EQUIPMENT

> Rotary Shears Capacities up to 1-inch mild steel

Power Hammers

Stamping Trimmers

Welding Positioners



KOOLSTACK FURNACES

Will Attract Post War Buyers

Because

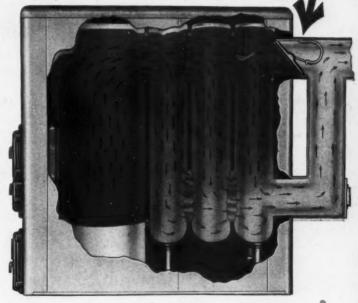
Koolstacks have the features that interest every *furnace* user.

More heating surface with the same amount of fuel. Engineered to heat homes — not chimneys.

All steel, all welded, permanently gas tight.

Wide range of sizes—35,000 to 180,000 BTUs, forced or gravity circulation.

FOR HANDFIRING STOKERS or OIL BURNERS This Is the Patented Automatic
Damper. It Saves Fuel
by Making More Heating
Surface Possible.



Showing Hot Gases Traveling Through Large Radiators

SUBJECT TO GEN'L LIMITATION ORDER L-22



SQUARE CASED WITH BLOWER



ROUND CASED GRAVITY



SQUARE CASED GRAVITY

LEADER IRON WORKS, INC. PECATUR 60,

y, 1944



What STEEL has to offer the Sheet Metal Specialist

THE qualities that have made steel the A-1 material for thousands of war uses will make it a prime material for construction after the war. No other material can do so many jobs so well.

Here are a few things that you can readily realize will mean more work for the sheet metal specialist.

improved Air conditioning. Great advancements in heating and air conditioning are now being perfected and will be ready right after the war. Warm air systems using steel furnaces and steel ducts will clean the air to a degree never achieved before. Improved temperature and humidity controls will assure freedom from drafts, cold areas, and incorrect humidity.

MORE EFFICIENT INSULATION. Ferro-Therm steel insulation reflects 95% of radiant heat. Winter heat trying to escape is directed back into the house. Summer heat from the sun is kept out. Steel insulation sheets retard fire, form dead air space between walls, are water-proof, vermin-proof and do not pack down.

DURABILITY. U·S·S Steels will be more versatile because of wartime research. They will be obtainable with improved corrosion resistance, increased physical properties, better surface coatings. Surface finishing, such as Bonderizing, will help to make painted surfaces more durable and longer lasting.

To help you toward better knowledge of our steels, we offer invaluable practical data, solutions to many of your pressing problems, in the U·S·S Sheet Metal Worker's Guide. Send today for your free copy.

U.S.S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago COLUMBIA STEEL COMPANY, San Francisco TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham

United States Steel Supply Company, Chicago, Warehouse Distributors
United States Steel Export Company, New York

U·S·S STEELS FOR SUCCESSFUL SHEET METAL WORKMANSHIP

U.S.S GALVANIZED STEEL for sheet metal structures requiring the added protection U.S.S CORPER D.

of a zinc coating.

U.S.S COPPER STEEL to give twice the atmospheric corrosion resistance of regular steel at little additional cost.

U.S.S PAINTBOND—A advantaged Residual cost.

U.S.S PAINTBOND—A galvanized, Bonderized sheet that permits immediate painting and holds paint tighter. U.S.S Dul-Kote,
a product with similar qualities, available
in the South and West.

in the South and West.

U-S-S MOT-ROLLED AND COLD-ROLLED
STEEL to provide the basic advantages of
steel, plus maximum economy, in accordance with the needs of each individual rich.
U-S-S STAINLESS AND HEAT-RESISTING
STEELS to assure high resistance to corrosion and heat, and to reduce weight.
U-S-S UTRENAMEL
Sheets designed
especially for porcelain enameling.
U-S-S LION ALLOW

especially for porcelain enameling.

U.S.S. LOW-ALLOY, HIGH-TENSILE STEELS to resist corrosion and increase strength-weight ratio.



UNITED STATES STEEL

TURE

MAYFLOWER AIR-CONDITIONERS, INC.

HEET

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eD of db.



 Quality in furnace repair parts like quality in new furnaces, must "be there" or no amount of skilled workmanship can make a good repair job.

When you buy Northwestern furnace repair parts, you buy top quality. You can assure your customer that the repair job is as good as new. Northwestern quality has been known for years in the heating industry. It is Northwestern's thorough knowledge of your requirements plus thorough knowledge of your requirements plus Northwestern's rigid inspection service that has Northwestern the first name for quality in repair parts.

Buy nothing but the best . . . buy from Northwestern for top quality, speedy delivery, economical cost.

Write to Northwestern today. We'll fill your needs promptly.

NORTHWESTERN STOVE REPAIR COMPANY 662 WEST ROOSEVELT ROAD CHICAGO, ILL.



Cibbon of HONDER

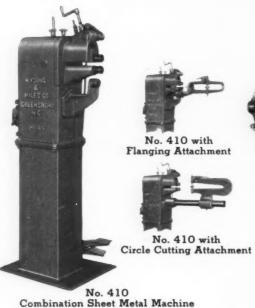
Together with our vital military manufacture of SuVeneer* Clad Metal runs the less-spectacular production of stainless and special alloy strip for aircraft and other essential war industries. Maintaining the superfine quality of these ribbons of steel is a point of honor today as in every year of this Company's progress.

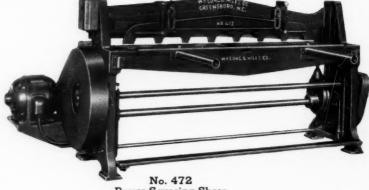
Trademark Reg. U. S. Pat. Off.

Superior Steel

Proven Superiority

for your SHEET METAL SHOP





Power Squaring Shear

Here are machines that will bring greater production and precision to your sheet metal shop. Simple . . . powerful . . . sturdy . . .

they are built to stand constant operation to meet today's heavy production demands.

Prompt delivery.



No. 411 Ring and Circle Shear

WYSONG and MILES

COMPANY

Designers and Builders of

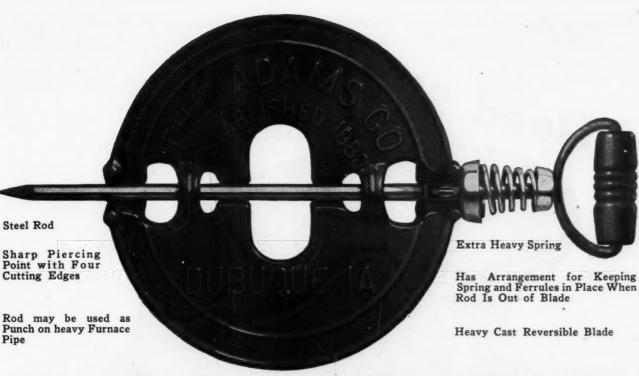
MACHINE TOOLS . . . For Over 40 Years

GREENSBORO, NORTH CAROLINA





No. 448 Foot Power Squaring Shear



ADAMS DIAMOND SMOKE PIPE DAMPER



No. 1 Adams Furnace Check Damper. End check and collar with full size openings, reversible for vertical or horizontal smoke pipe

Sizes 6 to 12 inches



Adams Damper Regulators 2 Sizes — 3 Styles.



No. 4 Adams Furnace Check Damper. Sizes 6 to 12 inches



No. 3 Adams Furnace Check Damper.

Reversible for vertical or horizontal smoke pipe.

Sizes 5 to 10 inches



Adams Steel Damper Clip No Rivet

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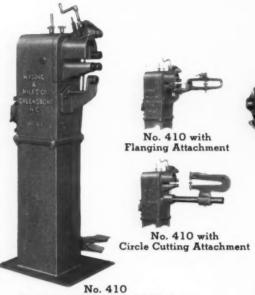
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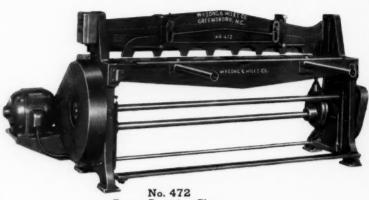
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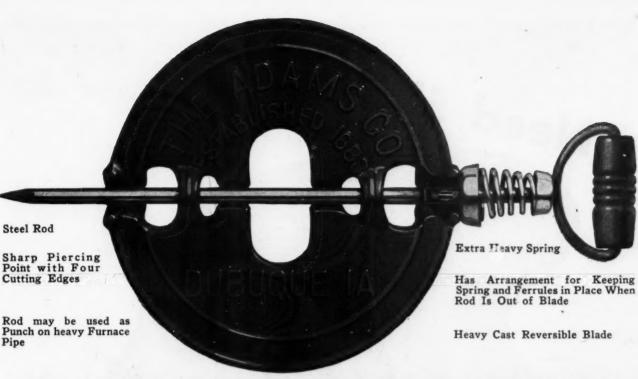
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1944's Most Vexing Problem . . . Manpower

HE survey of the Manpower Situation which follows in tabulated form, is another AMERICAN ARTI-SAN study among readers and was compiled in a manner similar to AA's Survey of the Furnace Situation (August issue). In brief, a questionnaire of some thirty questions was sent to a selected list of contractors in selected cities. The contractors were selected to represent both union and open shop firms; both large operators in heating, ventilating, general sheet metal and small job shops living today largely on maintenance and repair work. The towns were selected to cover as widely as possible those areas of the country where most manpower problems have been reported from readers. However, the West Coast was omitted because so much about its troubles have already been printed. New England was omitted because our type of work does not figure very prominently in that area's manpower troubles. The South was omitted because down there most big shops are roofers, warm air heating is negligible and certain troublesome problems-like heating equipment scarcities-do not figure so prominently in the general mixup.

Study Does Not Imply Needs

Unlike the August survey of furnace scarcities, this study on manpower is not intended as a base for projection to an actual need. In other words, in the furnace survey a given number of AA readers reported they needed so many furnaces, firepots, combustion chambers, etc.—all AA readers in those same cities then should require (by projection) so many of each item and a total industry need was arrived at.

We are not projecting this survey because we do not believe much, if anything, can be proved by such projection. Since we do not believe anyone can quickly solve the problem, the study which follows is primarily of interest and value because it shows where

shortages exist, the extent of the shortages, and gives some indication, we think of what has caused all the trouble.

What, if anything, can be done about the problem will be discussed in another section of this general survey.

Conclusions Are General

There are several interesting—and important—conclusions indicated in the columns of the survey. These are as follows (Survey on pages 82, 83):

1. Columns 1, 2, 3 show that—very roughly—our employers are now working only one-half the men they normally work in the Fall season. That if proper men could be made available, this industry could keep employed this winter at least $2\frac{1}{2}$ times as many men as it is able to find.

We have italicized the word "proper" because columns 16, 17, 18, show that our employers have been "up on their toes" to try any idea found useful in other industries, but that, in general, all these makeshifts have not been successful over the long haul.

The conclusion is our trade cannot train sheet metal mechanics by the same means or in the same time machine operators can be trained and if a man can't operate without supervision he is pretty useless to our industry.

2. Columns 5 and 6 indicate that union employees are making a higher hourly wage rate in our trade than the same men can make in most local war plants on non-construction work. Also, the highest rates actually paid by the war plants are about the rates we have heard are minimum—there's been a lot of talk about high wage rates which must be just gossip and nothing more.

But, again, we have italicized "hourly wage rates" because Columns 5 and 6, by themselves, do not tell the whole story. Columns 7 and 8 show that the

American Artisan's Survey of Manpower Problems

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Note A—Reader says he operates part time as follows: two men work 40 hours each. One man (former employee, now in defense) works all day Saturday. One man does oil burner service work two nights a week from 5 to 9 p. m. One man (works nights in war plant) works every day from 2 to 5:30 p. m. All these men are skilled mechanics and work without any supervision other than routing.

Note B—Former mechanics now working in war plants want still more money, so they buy materials from hungry jobbers and operate in their spare time (nights, days, Sundays). They charge less than established dealers. They also ask dealers to turn some of their surplus work over to them, promising to clean up the work quickly. Not being watched their workmanship is open to serious questioning.

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Waterloo

, 1944

"oig killings" have been made in overtime. Reader after reader reported that men known to him were working as much overtime as they could stand on their feet, thereby adding 30, 50 70, 100 per cent to their weekly wage.

There is no remedy for this situation. If the work must be done, overtime is inevitable. We cannot ordinarily work such long hours because our work is physically harder; its away from the shop; it can get out of hand unless constantly supervised by a job foreman.

This huge overtime pay problem which entices men away from us will, probably, solve itself as production levels off. Latest reports are that planes, ships, electrical equipment are still badly needed, but small ammunition, combat items of hundreds of types are already away ahead of schedule. In such cases, all overtime will eventually be cut out. When that time comes, our higher wage rates may look more attractive than today.

Biggest Losses in 1942

3. Columns 10 and 11 indicate that the industry took its big losses in 1942—not 1943. In 1942 the readers reporting lost just about as many men to the draft as to war plants and in each case the loss was about four times as heavy as in 1943. This seems to

refute some claims that our industry has lost men steadily month by month through two years.

Columns 10 and 11 are also interesting in that they show that shops everywhere lost men in about the same proportions to about the same sources indicating, perhaps, that big war plants "pulled" men from far away and that all selective service boards made about equal inroads on their "pools" in 1942.

60% of Deferments Granted

4. Three of the most interesting columns, in the opinion of the editors, are Columns 12, 13, 14. Column 12 designates whether the reader reporting is in a "critical" labor area. Roughly, 73 per cent of the shops reporting are in areas where labor is "short" and, in the opinion of the editors, more areas will become critical during 1944.

Column 13 asks if "deferment" was asked for certain employees and the information would have been more valuable if we had asked "on how many employees was deferment asked?" Nonetheless, readers reporting show that 52 per cent of the employers did ask for deferment for their men and Column 14 shows that almost 60 per cent of the applications were granted.

Note the above again—half the shops asked for deferment and almost 60 per cent of the applications were granted. This is a far different story from the loose gossip floating around. So let's look deeper into the matter.

Deferment Mostly Temporary

Column 14 also shows that many of the deferrments granted were only temporary—three months, six months. The reason probably is the wording of the WMC-WLB regulations which suggests that deferrment be granted "only for such time as may be required to train a man to take the applicants place." Seemingly, it was difficult for WMC-WLB-SSB boards to understand why it takes any longer for a "sheet





I—Our industry finds itself with only half the manpower we usually work in the fall and winter. We must get men.

2—Our wage rates are equal to or greater than war plants, but we cannot offer the overtime which swells pay envelopes.

metal worker" to be trained than it does a "turret lathe operator" who works in 10,000ths of an inch.

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We Have Tried Most Stop-Gaps

The problem has been settled, now, and a sheet metal worker is now recognized as a man requiring long training, but such was not the case in 1942 and early 1943 and that was when we lost our good, young men. It is too late to rectify the error, but some general suggestions which constitute another part of this survey may be helpful.

Column 15 shows that our industry, in almost all cases, has not tried to hold men by refusing them a "certificate of availability". Most readers reported—"it's useless to try and hold a man when he wants to quit—he wouldn't be worth anything, if you did make him stay", and Column 15 indicates that employers followed that idea.

The last four columns—16, 17, 18, 19—picture quite clearly, it seems, the different things our employers have tried to meet their manpower shortages. We have tried using young men under 18, in summer vacations, after school and on Saturday; we have tried working men and women part time; we tried to get "old timers" back in the harness, but the sum total of all these efforts has been negligible success.

The answer is not only easy to supply, but is graphically indicated in Columns 16, 17, 18. Note in Column 16 how frequently the comment "not interested", or "won't work" appears as the entry. These youngsters are still just that—youngsters; they cannot feel responsible, they want to play—in our type of work and under today's working conditions these boys can only be controlled when used on a production line under the constant supervision of a foreman.

Part Time Workers N.G.

Many reports also show somewhat the same trouble with part time workers. It may be all right for a bookkeeper to come into an airplane parts assembly line after his day's work and sit down and assemble pieces at a bench from 6:00 P.M. to midnight; but it's

3—We did not fight for recognition of the time needed to train men—our need now is permanent deferrments.

4—We cannot turn to stop-gap measures so successful in manufacturing—our need is skilled journeymen and apprentices.

5—Manpower problems will be more vexing in 1944 than materials. Lay plans now and get acquainted with your local WMC office.

Photographs used in this section released by Department of Commerce.

quite another thing for that same man to try to install a furnace after hours, or hang a gutter or pick up the details of a pattern unfinished from the day before. Yes, it is only in those shops where routine production of war items is carried on that part time workers have proved of any value in our industry.

And Column 18 shows that when the "old timers" were found they were either excellent or were too slow, but in most cases they couldn't be found. No one can blame these men for taking an "easy" job in a war plant in preference to our more strenuous requirements.

We Must Try New Schemes

So, finally, we are back where we started—we made a mistake when we did not appear as a national industry to explain to those in WMC, WLB, SSB, etc., why it takes a long time to make a sheet metal mechanic and why he is not a machine operator and cannot be trained as such. Quite possibly, it's too late now to do much about it. We can't get our men back from the army—we may be able to get some back from war plants as time goes on. It's too late now—in fact, its been too late ever since Pearl Harbor to launch a nationwide campaign to train sheet metal workers—what we can do from now on is suggested in another section of this general study.





How To Get



Had this industry realized in January, 1942, what a tremendous headache manpower was to turn out to be, we might have done something then to lessen the impact. We might have been prepared to prove that a "sheet metal worker" and a "heating service man" cannot be trained in three months or six months and so obtained longer deferment; we might have been prepared to prove how badly these men are needed to keep the community going—hence the need for permanent deferment; we might have prepared for a more orderly withdrawal of men from our shops to the armed services; we might have stopped "pirating" of our men to war plants.

We were not prepared—we didn't do much, concertedly, about these problems—and it is too late now to waste time thinking about what we might have done.

So far as our industry is concerned—and we are speaking of manufacturers and dealers or contractors—the problem we now face in 1944 is two-sided:

We need more men than we now have.
 We must hold the good men we still have.

The following discussion on this industry's manpower problem of 1944 follows these divisions.

That dealers and contractors will need more men in 1944 is indicated in the Study on Manpower on other pages. This study shows that we can use at least two and a half times as many men as we have. The problem in 1944 will be how to get these men.

As the picture now appears, there will be few sources from which contractors can get men. And by men we are not referring to unskilled help, but skilled sheet metal workers.

1-Discharged Veterans

As of December 12, army, navy, marines had discharged a total of 800,000 veterans. Most of these

men were discharged for medical reasons. The veteran is entitled to his old job back if he wants it, assistance in getting a new job, or to vocational rehabilitation or training.

Assuming that you want to employ a veteran who formerly did not work for you, here is the procedure. The Re-employment Division of Selective Service has delegated to the Veterans Employment Service the job of placing veterans. Veterans Employment Service is a part of the United States Employment Service. Stationed in USES offices are VES representatives who have a card file of veterans who will be discharged and returned home. Each veteran's qualifications and experience are all recorded. Any new trades learned in service are also recorded.

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If you want a veteran, then place yourself on record with the USES and if a proper veteran is registered with your local USES office you should be notified.

If, instead of being a furnace dealer or sheet metal contractor, you are engaged in manufacturing a war item or if you are a furnace or a pipe and fittings manufacturer the above paragraphs apply, but probably you will also have jobs which do not require the services of an all around sheet metal mechanic and can use and will want a veteran who can learn or be trained in the job you have open. In this case, veterans are eligible for special training provided by War Manpower Commission's apprentice training or training-within-industry program. Apprentices are paid while learning at rates fixed by the company, or by a union, or in some instances by the State. addition, certain veterans will be eligible for training through the Veterans' Administration and in some other instances by the Office of Vocational Rehabilitation of the Federal Security Agency.

Although no data is available at this time, it is quite likely that in both these training programs there will

New Workers

THERE are only two sources of new mechanics—discharged men from the armed forces and men now working in other plants. To get either requires special procedure described in this section. Our best plea in 1944 probably will be the "permanence and post war activity" of our industry.



be taught some of the elements of sheet metal work and sheet metal machinery operation. If so, and your need is for men with this training, again you should be registered with the USES which, so far as is known now, will be the clearing house through which employer and prospective veteran employee will get together.

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2-Men From War Plants

As the situation stands right now, the furnace dealer, the sheet metal contractor, the furnace manufacturer, the blower manufacturer and several other classifications of producers operating in our industry are included in the "Index to the List of Essential Activities" which is the guide of the War Manpower Commission. If your activity is included in this list it means, briefly, that in theory, your employees are as "necessary" as any worker in a war plant so you should not have your men hired away, nor should you hire men away from other essential industries.

Therefore, what you have you keep and what you have lost are gone forever. But this is somewhat oversimplification. Suppose one of your good sheet metal men left you in March, 1943 to take a job in a plane wing assembly plant where he got less per hour of wage than you paid, but could put in so much overtime that he almost doubled his weekly "takehome" wages. Let's further assume that much of this overtime is now eliminated and that it looks as though by the end of the winter your mechanic might be back at so much per hour, straight time for 40 hours. Your weekly wages look inviting—how can you legitimately get the man back?

At the present time Regulation No. 7 of the War Manpower Commission seems to control interchange of jobs. Roughly Regulation No. 7 says—"the objectives of the regulation are to eliminate all turnover in essential activities and all hiring and firing shall be under the terms of the Regional or Area Stabilization Plans. All hiring activities center in the United States Employment Service.

"An employer is not required to hire the worker sent him by the USES; employers may fire workers sent by USES. If the employer is unfair in his standards his supply of labor may be cut off. And the worker does not have to take the job to which he is sent by USES.

"Workers employed in critical occupations may be hired only in jobs which they are referred to by USES. No employer may hire a man from a critical occupation unless USES transfers him."

But workers must be employed at their top skill and this leaves a way open for our contractors to hire their men back.

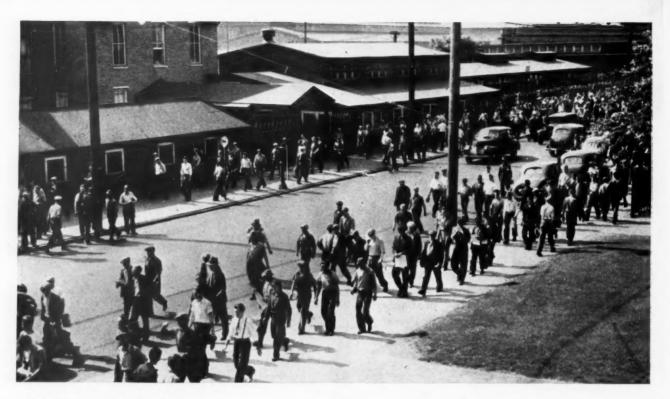
For example—a skilled sheet metal mechanic working in a plane parts plant wants to come back. We must prove that this man is using a higher skill when working for us than when working in the plane plant. And we must prove that our work is both essential and critical. The procedure is for both the mechanic and the employer to appear before USES and explain the circumstances. If USES approves, the plane parts employer will be asked to give the mechanic a "Certificate of Availability." If the employer refuses to issue a certificate, USES may issue one.

Readers report that USES has looked both favorably and has frowned on, appeals for transfer from war plants to plants in our industry. Probably much will depend on local conditions. If some local war plant really is in need of workers, USES will doubtless hold men in that plant. If war plant labor is not too critical a transfer might be approved. In any event it will be up to our industry to prove how badly we need the man. Don't appear just to argue—arm yourself with facts.

We Need Skilled Men

Reports from the study published in this issue indicate that untrained young men and untrained older men are of little help to the contractor of our indus-

(Continued on page 101)





How to Hold Jhe Men You Have

How to hold the men we still have may not be as much of a problem later in 1944 as it now appears to be, because—

- There may be fewer men called into the armed forces if the war goes well
- There may be a tremendous shifting of employment if more and more war product producers find their schedules cut.

In connection with (2) above it is of some interest to note that army in the last few weeks has, without notice, stopped dead a great number of contracts. We seem to have enough of many war items like tanks and ammunition and small arms. We still need more planes and ships but whether one program can and will be expanded to use all the workers laid off in other plants is very much a question at the moment.

Our industry and many other civilian product industries may find, early in 1944, that materials from which to make our products are available, but we will need approval to resume production. This point will bear careful watching in 1944.

If materials are available, and if we can get more men to increase production, this industry should be prepared to fight in Washington for recognition. Office of Civilian Requirements, at the moment, thinks furnaces for replacement are essential; pig iron is reported to be so plentiful that all restrictions will be removed; steel is getting easier (at least some steel production is curtailed); we would like to see, if possible, all the items on M-126 now restricted returned to production so that we can have warm air furnace

pipe and fittings, registers, humidifiers, controls, blowers, etc.

We should be in Washington now getting ready for open production.

But in order to make sure that we can start production—if, when and how—we must hold the men we still have. The following review of the orders and regulations effecting manpower indicate what steps we should take.

Selective Service Procedure Relating to Occupational Deferments

(Credit for much of the material in this section is extended Petroleum Industry War Council's "Manpower.")

The Selective Training and Service Act of 1940 (with subsequent amendments) requires every male citizen and all except a few non-declarant aliens between the ages of 18 and 65, inclusive, residing in the United States to register.

Males between 18 and 44, inclusive, are liable for military service.

On December 5, 1942, the induction of men 38 years of age and over into the Armed Forces was suspended only by Executive Order.

The law places upon all able-bodied men in certain age groups an equal obligation for military service, but recognizes the need for deferments.

Under the Act, every deferment must be granted on an individual basis. Deferment of any individuals by occupational groups is specifically prohibited.

I. Purpose

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It is in the national interest that certain activities engaged in war production or which contribute directly to the support of the war effort should be maintained where possible. It is necessary, therefore, to defer certain workers in industry until replacements can be obtained or trained. All deferments are temporary. Occupational deferments are granted for six months or less. The case is reopened at the expiration of that period for reconsideration by the local board, and further deferment may be granted for six months or less if the registrant is necessary and irreplaceable and the employer has made a reasonable but unsuccessful effort to obtain or train a replacement. Regulations require local boards to be careful not to impede the war production program.

2. Who Is Eligible for Occupational Deferment

A registrant is considered a "necessary man" in industry and is eligible for deferment only when all of the following conditions exist:

1. The registrant is engaged in an essential activity.

2. He cannot be replaced because of a shortage of persons with his qualifications or skill in such activity.

3. His removal would cause a loss in the effectiveness of that activity.

3. Essential Activities and Occupations

To guide the local boards in their determination of whether a man's work is essential, the War Manpower Commission has certified a list of thirty-five activities which are necessary to war production or are essential to the support of the war effort.

An Activity and Occupational Bulletin has been issued for each of the essential activities, listing the "essential occupations" in that activity. Local boards have been instructed to consider for deferment registrants working in these occupations. This does not mean that a man working in one of these occupations will be automatically deferred; neither does it mean that men working in other jobs will not be deferred. The test of "necessary man" will be applied by the local board, and each request for deferment should be made with this in mind.

Following are pertinent reports from branches of

WAR MANPOWER COMMISSION JOB DESCRIPTION

(For Use in Making Manning Tables)

	COMPANY NAME: X. Y. Z. Co.	2. ITEM NO. 1A LINE NO. 5 (As on Schedule A of Hamming Stables)
,	PLANT NAME:A	4. DEPARTMENT: Production Lathe
	JOB TITLE: BAND-SAW OPERATOR	
	(bist first most comm	on title and any additional titles separated by semicolons.
	MINIMUM TIME REQUIRED TO TRAIN A RE	PLACEMENT: 200 hours
	PHYSICAL REQUIREMENTS: None	
	(State unus and portio	mual requirements of job; eyesight, strength, or other on of job requiring trait!
	Receives work assignm	sents from Foreman, completing them according to
	SUPERVISION: prescribed standard	
	(Indicate type of st	uservision received or given)
	DESCRIPTION OF WORK PERFORMED: (Starspecial shills, machines, tools, judgme	ate surpose of job; how performed, including explanations, ents, decisions)
	Saw sheet metal blanks to	specified dimensions using a power-driven endles
	band saw; lays out dimensions given	in blueprint on metal stock using T square.
	compans, triangles and scriber or c	chalk to mark the lines; clasps stock to table
	of machine and adjusts the angle of	the table to make beveled or vertical cuts;
	starts band saw motor; directs a st	ream of lubricative fluid over the saw cut;
	feeds stock against saw using hand	or power-driven feed; cuts stock along scribed
		ary for each cut; unclamps and removes cut stock
	from work table.	

These "Job Descriptions" are both helpful and necessary in establishing length of time required to train a man. A "sheet metal worker" requires 4 years, but we didn't prove it soon enough.

our industry. Reports the National Warm Air Heating

and Air Conditioning Association:

The following manufacturing branches of our industry are included in the "Index to the List of Essential Activities" published by the War Manpower Commission: Blower filter units (furnace blowers); furnace blowers (blower-filter units); furnace casings, sheet metal; furnaces—electric, hot air and hot water; gas burners; heating units and devices; hot air and hot water furnaces; oil burner units; oil burners; thermostats and other temperature control devices; warm air furnaces.

Following is the War Manpower "List of Critical

Occupations":

Production and Service Occupations

1. Coremaker, all around.

2. Electrician, installation and maintenance, all around.

3. Engineering draftsman, design.

4. Foreman. Included under this designation are only individuals who are (1) utilizing in their supervisory jobs the knowledge and skills of one or more of the occupations included in the List of Critical Occupations, and (2) those who supervise directly or through subordinate foremen and supervisors production, technical or scientific work in essential activities, although the occupations of the workers supervised may not be listed. The second category includes only individuals who must be in jobs requiring an extensive knowledge of the production, technical, or scientific work they are supervising, the exercise of independent judgment and responsibility for the products made or services rendered, and a training period of two or more years. In some plants the supervisory personnel may be designated by other than supervisory titles and where they meet the requirements outlined above they are included.

5. Heat treater.

6. Inspector. Included under this designation are only those workers who are qualified to perform in one or more of the critical occupations appearing in this list and who utilize the knowledge and skill of such occupations in inspecting work in order to insure uniformity and accuracy of products or services.

7. Layout man, boilermaking, foundry, machinery

or shipbuilding.

8. Machinist, all around.

9. Molder, bench or floor, all around.

10. Tool designer.

11. Tool maker.

12. Accountant. Included under this title are certified public accountants and those who have comparable training, experience or responsibilities.

13. Engineer, professional or technical. This title covers persons who are actually engaged as engineers in the operating, research or teaching phases of these professions, who are qualified either by having met the educational requirements or because of long experience. In addition, this title is intended to include those individuals who may specialize in certain phases of the professions listed below, such as mechanical engineers who specialize in the automotive, heating or refrigerating engineering field but whose special designations have not been mentioned: Aeronautical, agricultural, ceramic, chemical, civil, communications, electrical, marine, mechanical, metallurgical, mining, petroleum, radio, safety.

N. J. Biddle, Secretary of the Detroit and Michigan contractors' associations, has investigated this manpower problem exhaustively and as of the middle of

November reported thus:

Long term occupational deferments for workers employing critical skills in essential industries seem pretty well assured by recent WMC instructions. Local draft boards have previously been requested to postpone the induction of men of critical skills until they had been given an opportunity to find work in an essential industry (A-704). They are now forbidden to order the induction of any worker possessing a critical skill until at least 30 days after the case has been referred to USES for examination and advice. If within 30 days USES certified that the worker's present employment or a new job in which he has been placed fully utilizes his special qualifications, an additional 10 days' grace is given for the employer to file a new request for occupational deferment (see A-712 et seq.). Upon receipt of the new 42-A, the draft board will then reopen the employee's classification and will consider deferment in the light of the new

Note that the double checking of local draft board decisions not only gives critical workers additional protection against induction, but also gives USES additional power. The extent of USES's authority has been comparatively limited, but its hand is greatly strengthened now that WMC—superior to both USES and Selective Service—virtually instructs draft boards to follow USES's decision on dubious occupational deferment cases. Local boards are losing their autonomy; WMC is carefully judging the relative manpower needs of essential producers against those of the armed forces. Confined at the moment to the disposition of new workers, this development may gradually expand until the manpower problem is solved, at least in the critical industrial area.

Then, of course, there is the proposition of being declared essential, which, from the information available, is limited to individual firms and is not a blanket coverage because you are in a certain industry.

The WMC is compiling a directory of all business throughout the United States and indicating their essentiality, if any, and the degree of essentiality. It would seem that the Manning Tables would fit logically into this program for the larger firms.

4. Occupational Classifications

To guide Selective Boards these rules are in force: Occupational deferment classifications are:

1. II-A. Registrants who are necessary or essential in their civilian activity (relates to civilian activity necessary to the national health, safety or interest).

2. II-B. Registrants who are necessary or essential to the war production program.

3. II-C. Agricultural registrants.

Class II deferments are for a period of six months or less. If there is a change in the registrant's status during the period in either class, the classification will be reopened and considered anew.

When a registrant in Class II-A is classified anew (at the expiration of his deferment), the local board will review the case to determine whether a reasonable but unsuccessful effort has been made during the period of deferment to secure or to train a replacement, and by provision of Selective Service Regulations will not again place the registrant in II-A unless convinced that such classification is warranted.

The classifications of Class II-B registrants are likewise reopened at the expiration of their respective deferments, and they are classified anew, but the regulations require local boards to be careful not to impede the war production program. The registrant should be again classified in Class II-B for a period of six

months or less if such classification is warranted and if the employer has made a reasonable but unsuccessful effort to secure or train a replacement for the registrant during the period of deferment.

How to Request Occupational Deferment for an Employee

Request for occupational deferment must be made by filing with the Local Selective Service Board an Affidavit for Occupational Classification (Industrial) on D.S.S. Form 42A (Revised 9-15-42).

Each case should be prepared with great care. Be sure to give complete and detailed information to show (a) the essential nature of the activity in which the employee is engaged, and (b) why the registrant is a "necessary man" in that activity. The employee's duties should be described in detail. Evidence must also be included to show the degree of training, skill and experience required, and what efforts have been made to obtain and train replacements. Be specific; general statements are inadequate. Attach statements or affidavits to Form 42A whenever necessary to present additional information which will help the local board in considering your request. There is an important selling job to do in each case. It is your responsibility to convince the local board that you are making a real effort to work out your own manpower problems.

If Form 42A has already been filed and a Manning Table and Replacement Schedule is drawn up later, a new Form 42A should be filed in each case, but show on it the State acceptance number of the Replacement Schedule. The period of deferment should agree with the Replacement Schedule.

When an employee is classified or reclassified, he is mailed Form 57, Notice of Classification. If the employer has filed Form 42A, he should receive notice on Form 59, Classification Advice, but this isn't always done and employees, therefore, should promptly report any change in their draft status.

6. Appeals Procedure

When a registrant is notified of his reclassification in I-A, the employer has ten days from the date Notice of Classification was mailed by the local board in which to file an appeal.

At this point you should review the case carefully to determine whether the employee is a "necessary man." If additional time is required to secure or train a replacement (or if the Replacement Schedule has been violated), an appeal should be filed. It is advisable, however, before filing Notice of Appeal to exhaust the possibilities of handling the matter satisfactorily with the local board. In other words, after the registrant is reclassified in I-A, ask the local board to reopen the case and consider anew the registrant's classification. A personal appearance may enable you to convince the local board that deferment should be granted. If the local board refuses to reopen the case, the appeal should be filed before the ten days expire. No particular form is necessary. A letter to the local board by the employer indicating that he wishes a review of the case by the Board of Appeals is sufficient. After the ten days have elapsed, the employer has no right to appeal, but the local board is authorized to permit an appeal if it is satisfied that the failure to appeal within the ten day period was due to a lack of understanding of the right to appeal or to some cause beyond the control of the employer filing the appeal. The local board cannot allow an appeal to be taken after it has mailed the registrant the order to report for induction (Form 150). The employer should, therefore, see that all appeals are filed without delay.

The appeal procedure emphasizes the need for complete information being furnished when Form 42A is filed, as there are no appearances before the Appeal Board, and new evidence cannot be placed in the registrant's file between the time the local board makes its final decision and the time the Board of Appeals hears the case. The function of the Appeal Board is to review the decisions of local boards and they can consider only such information as was available to the local board. The employer may, however, attach to his Notice of Appeal a statement specifying the respects in which he believes the local board erred, may direct attention to any information in the registrant's file which he believes the local board has failed to consider or give sufficient weight, and may set out in full any information which was offered to the local board and which the local board failed to include in the registrant's file.

7. Transfer of Appeals

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When an appeal is taken from a classification of a registrant upon the ground that he should have been deferred by reason of his occupation, the employer may ask to have the appeal transferred to the Board of Appeals having jurisdiction over the area in which the registrant is then employed. The request for transfer must be made when the appeal is first filed.

It should state (a) in what respect an occupational question is involved, and (b) the name of the registrant's employer and the street address, county and state where the registrant is employed.

When a request for transfer is made and meets the requirements, the case is forwarded to the State Director of

the state in which the man is registered and is sent by him to the Appeal Board within his state which has jurisdiction over the place of employment of the registrant if it is in that state. Otherwise, he forwards it to the State Director of the state in which the registrant is employed for reference to the Appeal Board having jurisdiction where the man works.

8. State Director of Selective Service

If an appeal has been taken and the employee is continued in Class I-A by the Appeal Board's decision, the employer may then communicate with the State Director of Selective Service of the state in which the registrant's local board is located, requesting him to review the case. (If the appeal was transferred to another state, the employer may appeal to either the State Director of Selective Service in which the local board of origin is located, or to the State Director of the state where the Appeal Board is located.) The State Director has the right to direct a reopening and consideration anew or he may appeal to the President from the classification made by the Board of Appeals. Such requests for review should be made in writing within ten days after the Appeal Board's decision. (If a Replacement Schedule previously has been approved by the State Director and it is violated by the local board's action, be sure to give the Replacement Schedule number and indicate how it has been violated.)

Each State Director has one or more assistants who are assigned to occupational classifications. They are available to employers for a consultation at the head-quarters office or, if the employer prefers, they are available to visit his plant or office for complete dis-

cussion of all problems of the activity which involves Selective Service. You should avail yourself of this service for advice on local deferment problems and procedure.

If the State Director concludes to take no further action after the employer has requested him to review the case, the employer may communicate with the National Director of Selective Service in Washington, D. C., and request that he review the case. The Director of Selective Service, like the State Director, may direct the local board to reopen and consider anew the case or he may appeal to the President from the classification made by the Board of Appeals.

9. Appeal to the President

If the Appeal Board's decision is unfavorable and if one or more members of the Board of Appeals dissents from such classification, the employer has ten days after the local board mails the Notice of Continuance of Classification (Form 58) or Notice of Classification (Form 57) informing the registrant of the disposition of the case by the Board of Appeals, to appeal a decision of the Board of Appeals to the President.

As in the case of appeals to the Board of Appeals, the appeal to the President may be taken by mailing or delivering to the local board a written notice of appeal. Such a notice need not follow any prescribed wording, but should include the name of the regis-

trant, his serial and order number, the identity of the person filing the appeal, signifying the relationship of the registrant which gives the employer the right to appeal, and a statement that a Presidential review of the decision of the Board of Appeals is desired.

As previously indicated, the State Director or the Director of Selective Service may appeal to the President from any action of a Board of Appeals if they consider it necessary in the national interests or to prevent an injustice. In cases where it appears that the local board or the Board of Appeals has disregarded Selective Service regulations, the employer should call this fact to the attention of the State Director in order that he may consider whether further action is warranted.

Replacement Schedule Plan

The most effective means of dealing with Selective Service withdrawals is through the use of "Replacement Schedules." The replacement schedule plan is part of Selective Service procedure and is also part of the War Manpower Commission manning table plan. Replacement schedules are submitted to State Directors of Selective Service.

1. Advantages

American Artisan

Manpower

Study

The replacement schedule plan is not of particular advantage to individual employers who have a small percentage of employees of draft age. In such circumstances the regular deferment procedure will probably suffice. The replacement schedule plan, however, is of distinct advantage to employers who have a relatively high percentage of employees of draft age, because (a) it provides for orderly release to Selective Service of workers who are drafted, and (b) it provides the maximum possible protection of key personnel who must be deferred because of their occupation and skill.

REPLACEMENT SUMMARY

Company A. Lineen Sheet Metal Co.

Location 266 Elm St. Dallas Texas

Sheet 1 of 1 Sheets .

ine		Diction-		No	45	8 Or Over 38 Through	Under	Physi- cally	workers li	ried	Single
No 1	By Departments	Code (Option)	No. of Workers	of Women	over 6	44 7	8	Disqual- ified 9		Without Children 11	12
-		0-19.04	1		1						
1	President & Engineer	0-19.04	î	1	_	1	1				1
2	Vice "	0-19.04	ī	1	1			-			l
3	Secretary	0-97.03	1					1			
2	Office Manager	0-97.12		1		1	1			1	1
5	Production Manager	0-97.51	1	1	1	1	1		1	1	1
6	Chief Engineer	0-19.01		1	1		1			1	1
8	Design Engineer	0-19.01		1			1			1	-
9	Draftsman-Mechanical	0-48.18	6	1	1	2	1	2	1	1 -	1
0	Field Engineers	0-19.04	3	ı		1	1	1	1		1 -
1	Consulting Engineer	0-19.01	2	1	1	1	١.	1	1	1 1	1
2	Clark	1-05.01	5 2	1	1	1	1	1	1	1 -	ı
3	Telephone Operator	1-42,32	2	2	1	1	1	1			1
4	Bookkeeper	1-01,02	1	1		1		1	1		1
15	Stenographer	1-37,12	5	5	1 .		1	1		1	1
.6	Superintendent	0-97.51	1	1	1	1 .	1	1	1	1	1
7	Assistant Supts	0-97.51	2			1	1	1	1 3	1	1
LB	Field Superintendent	4-80.01			3	2 4		1	3 1 20	1	1
9	Layout Men	4-80.02			1	4			20	4	6
20	Journeymen	4-80.01		1	18	27	1	1	5	1	2
2	Helpers	7-97.04	16		2	5	-	-	-	+	1
100	Cumulative totals		139	8	31	47	1	3	31	6	12

Left - The "Replacement Summary" should be made on the official form (not this one).
The employer should list all the jobs by plant departments. Opposite each job, list the total number of workers engaged by Selective Service Status (columns 6, 7, 8, 9, 10, 11, 12).

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Right — The "Replacement List" should classify jobs the same as the "Replacement Summary," but enter actual worker's name. After each name, indicate the month of replacement by a check mark in the proper col-umn (9, 10, 11, 12, 13, 14, 15). Any employee reaching age of 18 must be classified immediately.

REPLACEMENT LIST

OF EMPLOYEES-ANTICIPATED REPLACEMENTS PER MONTH OR PERIOD Company A Linean Sheet Metal Co Location 266 Elm St, Dallas, Tex Plant Job Title Sta. ocal Draft Bo County State 9 Draftene Mecha 4 4th 5th 10 Field Eng s M. Smith James M. Smit R. W. Brown Mm. E. Greene Falls R. Bowen Rein, J. Owen O. W. Patcher Ous. M. Cook John S. Perkin M. M. Thatcher Malter Ripper Etc. 8 35 27 30 19 35 33 27 33 37 10 11 2-4 1-4 2-8 2-8 3-8 2-4 1-4 1-4 1-4 12 12 Dallas # 5 21 66 29 2 22 22 16 11 22 29 Clerk 10722 1899 547 2244 866 1251 4567 6789 10896 23 Asst Supt 21 Helpers or Benj. R. Colline REPLACEMENT SCHEDULE TITLE SHEET

Company A Lineen Sheet Metal Co Location of Plant 266 Kim

Busher Street

Busher Industrial Sheet North Number of sheets in Replacement List Number of sheets in Replacement Summary TOTALS FROM REPLACEMENT LIST TOTALS FROM REPLACEMENT SUMMARY 1st month (Col.9) Total number of workers (Col. 4)_ 2nd month (Col. 10)_ Women (Col. 5)_ 3rd month (Col. 11)_

Ment (Cols. 6-7-8) Age 45 years or over Age 38 years through 44 years _ Age under 18 years_ Men: Age 18-38 years, inclusive (Colums 9-10-11-12) Physically disqualified 31 6 Married without children _ 12 Single __ GRAND TOTAL

DATE SUBMITTED 10/1/43

Ath month (Col. 12)_ 5th month (Col. 13) 6th month (Col. 14)_ 10 More than 6 months (Col. 15)_ GRAND TOTAL _

Signed: Company A. Lineen Sheet Metal Co By_

Title

Left - The "Replacement Schedule Title Sheet" must accompany the two forms above to the State Director of Selective Service for consideration. This sheet is a summary of the other two sheets and is signed by the employer.

2. Who Is Eligible?

In general, employers of all classifications in our industry are eligible to participate in the replacement schedule plan. Likewise, employers engaged in the servicing of heating equipment are eligible.

However, employers of fewer than 30 workers will

not find this plan of any advantage.

3. Plan and Procedure

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Information concerning replacement schedules can be secured by contacting the office of the appropriate State Director of the Selective Service System. The general details are as follows:

(a) Replacement Schedule—The Replacement Schedule consists of a Plant Summary and Replacement List prepared by the employer, presenting a condensed summary of the employer's personnel requirements, together with a list of men who must be considered for replacement and the month or period in which

such replacements are expected to be made.

(b) Acceptance by State Director—When an employer has completed the Replacement Schedule, he will submit the original and one copy to the State Director of Selective Service for the state in which the plant or activity is located. If the State Director of Selective Service, upon review, considers that the employer is providing for the replacement of registrants in a manner consistent with Selective Service policies, he will assign to the employer a State Acceptance Number. The employer will then be authorized to use this State Acceptance Number and to place a certification on the Affidavit-Occupational Classification (Form 42A) indicating that the Form 42A is filed in accordance with the Replacement Schedule accepted by the State Director.

(c) Job Descriptions—Wherever possible, it is recommended that employers use the special industry job

descriptions.

(d) Certification by Employer—The certification authorized for use by the employer will contain the Acceptance Number and the name of the State in a prescribed form. The certification will be placed on the Affidavit-Occupational Classification (Form 42A) in the space just above that provided for the affidavit of the company official designated to sign such forms. The certification will be placed on Form 42A in lieu of an answer to the following questions: "Number of employees now—number additional needed in next six months—number additional needed next year," and represents an affirmative answer to the question: "Is a replacement program in operation?"

(e) Filing Affidavit—Occupational Classification and Occupational Certification—The procedure for filing Forms 42A under a Replacement Schedule for consideration of classification by the local board is as

follows:

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The employer will file a new Form 42A bearing the State Acceptance Number and certification for all men for whom a deferment is requested in accordance with the Replacement Schedule. Forms 42A will be filed direct with the local board in the usual manner.

If it is necessary to file a Form 42A for a man scheduled for replacement in six months or less, the employer will indicate the number of days for which deferment is requested. For example, the question on Form 42A, "How long will it take you to replace this employee?" will be answered as follows, "60 days," "90 days," etc.

For all men who will be replaced in the second 6-month period, the question on Form 42A, "How long will it take you to replace this employee?" will

be answered as follows: "6 months to 12 months."

For all men remaining for whom deferment of more than one year is requested, the question on Form 42A, "How long will it take you to replace this employee?" will be answered as follows: "More than 12 months."

(f) Revision of Replacement Schedule—If circumstances should arise which warrant a revision in a Replacement Schedule, the State Director may approve such revision, and the employer will then be authorized to file such new Forms 42A as may be necessary under such approved revision. In addition to the State Acceptance Number and certification, the employer shall stamp or write on such new Forms 42A the word "Revised," and the revised Forms 42A will supersede Forms 42A previously filed for such registrants.

Note—Under revised regulations effective July 1, 1943, it is necessary for employers to schedule replacement after October 1 of registrants 18-38 years of age who have wives and children or who have children under 18, born on or before September 14, 1942.

(g) Consideration of Affidavit-Occupational Classification. The acceptance of a Replacement Schedule indicates that careful consideration has been given by the employer, by the State Director, and possibly by other governmental agencies to the employment requirements of the particular plant and the time required to replace the workers in each job classification. Local boards will give serious consideration to requests for occupational classification in accordance with the replacement time indicated in order to accomplish the orderly replacement of men in essential activities without a loss of effectiveness in such activities. Replacement Schedules are on file in the office of the State Director of Selective Service of the State in which a plant is located, and full information concerning them is available to local boards at all times.

(h) Employers Not Using Replacement Schedules— It is not expected that all employers will use the Replacement Schedule. Local boards should continue to give consideration as provided by Selective Service Regulations and National Headquarters policies to affidavits of occupational classification submitted by employers who do not make use of an accepted Re-

placement Schedule.

The Manning Table Plan

The Manning Table is a listing, with appropriate supporting data, of the different kinds of jobs in a plant or activity from the viewpoint of the type of worker needed to fill each job. The Manning Table records all the different kinds of jobs and describes the skill, training, and experience needed by the worker to fill each job. It also requires a showing of the essential characteristics needed by each worker for each job and the estimated length of time required to train a replacement for each worker.

Advantages

The Manning Table Plan provides for a complete manpower inventory of the company or plant using it. This information emphasizes to management many important facts:

1. The different kinds of jobs in the plant or ac-

tivity.

2. The number of workers necessary to do each kind of job.

3. The type of worker suited to do each job and the possibility of substituting other workers of less skill.

(Continued on page-214)



How to Raise Salaries

(Executives, Foremen)

NDER the Anti-Inflation Act of October 2, 1942 and subsequent Executive Orders, wages and salaries were generally stabilized as of September 15, 1942, subject to such changes as are provided by regulations approved by the Office of Economic Stabilization and issued by the National War Labor Board and the Commissioner of Internal Revenue.

The practical administration of the wage and salary stabilization is carried on by the National War Labor Board through regional boards and field offices of the Wage and Hour Divisions of the Labor Department and the Commissioner of Internal Revenue through regional Salary Stabilization Units (SSU).

This report deals only with the problem of salary adjustments permissible under an extended work week (48 hours) for employees coming within the jurisdiction of the Treasury Department Bureau of Internal Revenue Salary Stabilization Unit (SSU). Such employees will here be termed "exempt" as contrasted with the "non-exempts" who come within the jurisdiction of the War Labor Board for salary stabilization purposes.

The problem immediately arises as to salary adjustments for "exempt" employees necessary to compensate for the longer service. The Treasury Department has ruled that payment of overtime for exempt employees is considered an increase in compensation and requires the approval of the Commissioner of Internal Revenue (through the SSU), unless prior to October 3, 1942, it was the customary practice of the employers to pay overtime and the rate and scheduled number of hours have not been changed.

The Department has issued only general statements of its position, but examination of approved applications and discussion with the management of several companies indicates that applications conforming to the formula described below will probably be approved.

The following is quoted from a press release dated July 1, 1943 by the Commissioner of Internal Revenue:

"In the application of this principle, the highest participating pay level in direct line of supervision and the minimum additional compensation necessary for that level shall be determined to the satisfaction of the Commissioner. The amount allowable to the highest rated hourly employee will then be progressively reduced for the several intervening pay levels in such manner that each succeeding higher level receives a proportionately lesser amount, until the minimum amount allowable for the highest participating pay level as previously determined is reached."

To illustrate the principle:

First, it is necessary to determine the total dollars increase paid to the highest paid group of non-exempt employees. If that group, let us say, is paid basic compensation of \$300 per month and its work week is

increased from 40 to 48 hours, an increase of \$90 per month results. (Time and one-half for eight hours equals a 30% of basic pay.)

Second, then it is necessary to determine the various classes of exempt employees for which salary adjustment is necessary so that they may have more takehome compensation than their subordinates and in order to provide the minimum differential between groups necessary for the maintenance of productive efficiency. Third, it is necessary to determine the pay levels of the supervisors whose hours are not directly affected by the increased work week and to whom no overtime compensation is allowable, because under the "Hold-the-Line" Order payment for overtime is permissible only to those positions where the hours of work are directly affected. The amount allowable should then be tapered from time and one-half to zero at the pay level where the position is not affected by the extended work week. Let us suppose there were five groups of employees running from sub-foremen up to district or plant superintendents, whom it is deemed desirable to compensate for increased working

The amount of increased compensation which may be paid these five classes of employees is determined as follows:

- A. Number the five classes consecutively, starting with one for the highest level.
- B. Divide the increased dollars paid to the highest group of "non-exempts" (\$90) by five plus one, or six.
- C. Multiply the result of B by the class number, the product being the amount of increase allowed for that class.

To illustrate:

Assume that the dollar increase to be paid the highest group of "non-exempts" is \$90. The number of levels of "exempt" classifications is 5. The amount of increased compensation which can be paid each class is:

Class 1. (Highest level) $\frac{50}{6} \times 1 = 15 per month

2.	" $\times 2 = 30$	66	41
3.	" ×3= 45	66	6
4.	" $\times 4 = 60$	66	6
5.	" $\times 5 = 75$	44	6

While there is no definite ceiling, such as \$7500, beyond which overtime may not be allowed, as a general statement it should be pointed out that companies are not free to adjust salaries for any number of salary brackets, but only to the extent that the positions are affected by the extended work week. In some companies the ceiling might be \$6000, while in others it might be somewhat above \$7500. It is necessary to demonstrate to the satisfaction of the Salary

(Continued on page 169)

How to Raise Wages

(Mechanics, Laborers)



In amendments to General Order 31, the War Labor Board has simplified the formula by which the small business man (with 30 or fewer employees) may award merit increases, and has streamlined the procedure for any employer who wishes to grant an individual wage adjustment. The new regulations retain the general controls of the national wage and salary stabilization program.

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The order sets forth requirements which must be met in order to make individual wage or salary adjustments for merit increases, promotions or reclassifications and in connection with apprentice or trainee programs, without applying to the WLB for approval in each case.

Permissible Automatic Increase

The formula for firms with 30 or fewer employees permits them to make merit increases without WLB approval, provided that the total of increases to any individual does not exceed 10 cents per straight-time hour during any year, starting with last July 1 and that the total amount expended on such increases during any such year does not exceed an average of 5 cents per straight time hour for all the employees in the establishment whose wages or salaries are subject to the WLB jurisdiction.

Such increases must not result in rates exceeding the highest rate paid by the employer between July 1, 1942, and June 30, 1943, for jobs of similar skill, duties and responsibilities.

As in the case of the larger companies, such increases are not to result in any appreciable rise in production costs, furnish a basis for a price increase nor be used as a basis for asking the WLB for approval of increases in other rates to eliminate intraestablishment inequities.

The increases cannot be made if they are contrary to the terms of any collective bargaining contract covering any or all of the employees of the company involved.

If the small company wishes, it may apply to the WLB for approval of a schedule for making individual pay increases in the same manner as provided in other sections of General Order 31 for companies with more than 30 employees.

The original General Order 31 was issued June 1, 1943. As amended, it contains a new and simplified plan for individual increases which companies may use if they do not have a schedule which meets Board requirements. Companies also may apply to the Regional War Labor Board for approval of their own proposed new schedules.

Unless they operate under schedules meeting WLB specifications as outlined in General Order 31, companies with more than 30 employees must obtain Board approval of individual wage increases, even if they are of the so-called "merit increase" type.

Schedules, to meet WLB specifications, must contain the following: (1) job classification rates or rate ranges, and (2) a plan for making individual adjustments within and between such rates or rate ranges. Existing schedules do not require Board approval if they fulfill the specifications in the Order for job descriptions and for a plan of procedure for making adjustments, and if the plan was properly in existence because it either:

- 1. Was contained in a collective bargaining contract or other bona fide, established agreement which was in effect on June 30, 1943; or
- 2. Conformed to written statements, minutes or memoranda of the employer which were in existence and effect on or before June 30, 1943; or
- 3. Was a plan approved by the WLB or any of its authorized agents.

Employers who cannot meet those specifications with their established schedule may apply for Board approval of a schedule or they may adopt a plan outlined in the General Order without seeking WLB approval.

Details of the Plan

This plan permits increases as follows:

- 1. Merit increases or automatic length-of service increases: These must be made only within job classification rate ranges. The total to any individual employee shall not exceed, during any year (beginning July 1, 1943), 10 cents per straight-time hour or more than two-thirds of the difference between the appropriate minimum and maximum rates, whichever increase is greater. The total amount expended on such increases during any such year shall not exceed an average of 5 cents per straight-time hour for all the employees in the establishment who are covered by the plan and whose wage or salary rates are subject to WLB jurisdiction.
- 2. Promotions or reclassifications: When promoted or reclassified into a higher-rated job classification, an employee may receive a rate not in excess of 15 per cent above his rate on his former job or the minimum rate for the new job, whichever is higher. Where an employee has special ability and experience, he may be paid a rate within the appropriate range corresponding to such ability and experience.
- 3. Apprentice or trainee programs: These involved individual rate adjustments resulting from improvement, over specified periods of time, in the productive abilities of apprentices or trainees who are employed under a bonafide apprentice or trainee program (as defined in the Order). The increases in rates must conform to standards set forth in a collective bargaining agreement or in the applicable regulations of federal or state agencies.

"Merit increases" are defined as "individual wage or salary adjustments made as a reward for improved quantity and/or quality of work or service."

"Automatic length-of-service increases" are defined as "individual adjustments usually made automatically at the end of specified periods of satisfactory service."

(Continued on page 200)

The Wage and Hour Law in 1944

[Prepared by the Magazine Service Section]

WAGE order establishing a 40 cent minimum hourly wage under the Fair Labor Standards Act for the metals, plastics, machinery, instruments, and allied industries became effective September 13, 1943, and a similar order for the construction industry has been recommended and is now under consideration by L. Metcalfe Walling, Administrator of the Wage and Hour and Public Contracts Divisions of the U.S. Department of Labor. Both recommendations were made by Industry Committees, the first of which met in New York City, in February of last year and the one for the construction industry, in October. In both cases, the vote for that minimum was unanimous, management joining with labor and the public in recommending the highest minimum possible fixed by Congress under the Act.

That minimum, by Congressional mandate, was to have become automatically established in all covered industries no later than October, 1945, or after the Act had been in effect seven years. Industry Committees in the interim were charged with the responsibility of raising the minimum wage from the statutory 30 cents, effective in 1939, to the higher figure as rapidly as was economically feasible without seriously curtailing employment. By action of sixty-nine committees meeting over the last several years the way has now been cleared for the establishment of the 40 cent minimum almost two years ahead of the Congressional deadline.

Basic Provisions

By now employers and employees alike are familiar with the basic provisions of the Wage and Hour Law, as it is commonly called. They know that it applies to employees engaged in interstate commerce or in the production of goods for interstate commerce. Unless specifically exempted by the Act, all such employees must be paid not less than the minimum wage and not less than time and a half their basic rate for all hours worked beyond 40 a week. Some 500,000 establishments and 21,000,000 employees are now covered.

But neither these figures nor the basic provisions of the Act give any real idea of how the law operates. Before discussion its direct application to the sheet metal trade and related fields, let us see how the Federal Government set about enforcing this statute.

Enforcement is the task of the Wage and Hour Division, which was recently merged with the Public Contracts Division, both being in the U. S. Department of Labor. In addition to an extensive campaign

of education carried on through the cooperation of the daily press, trade publications and associations, and other groups, the combined Divisions maintain joint regional and field offices, strategically placed from coast to coast. A staff of more than one thousand inspectors is engaged in

visiting manufacturing and other establishments throughout the country.

Enforcement policy has stressed the importance of education and voluntary compliance wherever employers were cooperative, and that policy will be continued.

Though most readers of AMERICAN ARTISAN are familiar with the basic provisions of the Act, there may be some dealers who will be interested in Section 13(a)(2), which exempts from both the minimum wage and over-time provisions any person "employed in a retail or service establishment the greater part of whose selling or servicing is in intrastate commerce."

Just how does the Division define the terms "retail" and "service" establishment for the purposes of Section 13(a)(2)? Interpretative Bulletin No. 6, issued by the Wage and Hour Division, discusses the matter in detail. Here are the highlights.

What Is a "Service" Firm?

A retail establishment is characterized by numerous small sales to private consumers. A retail sale is a sale of goods for direct consumption and not for purposes of resale or redistribution in any form. Thus sales to wholesalers, jobbers or retailers for resale by them are not considered retail sales, regardless of the price or quantity involved.

Service establishments have somewhat similar characteristics. They are usually local in character, open to the general consuming public and usually render a service to private individuals for direct consumption. Says Interpretative Bulletin No. 6, "The service is usually purchased in small quantities for private use rather than for industrial and business purposes. Further, the service is usually rendered at a 'retail' price."

These brief descriptions will serve to identify many typical concerns—the corner retail grocery, drug store or butcher shop and such service establishments as shoe-repair and shine shops, parking lots, battery repair shops, watch and jewelry repair shops.

The problem is not so simple, however, for sheetmetal firms and contractors in related fields. Some of them may make sales which the Wage and Hour Division does not consider retail for the purposes of Section 13(a)(2) and they may also undertake work which the Division regards as manufacturing rather than the processing which is incidental to retail selling.

Let us discuss the first situation more fully. Sales

to private individuals for direct consumption will generally be considered retail transactions. Sales of similar equipment to business and industrial users may not be considered retail sales if the quantity sold is materially larger than private individuals would purchase and at a discount from the



retail price. And the sale to industrial and business users of special equipment not used in residential installations (such as an air conditioning unit for a theater or office) will be considered non-retail.

Occasional discrepancies will not defeat the exemption granted retail establishments under Section 13(a)(2), provided that the dollar volume of such non-retail sales does not exceed 25 per cent of the establishment's gross receipts during the prior sixmonths' period ending June 30 or December 31. In other words, a dealer who specialized in selling equipment for residential use could still take on non-retail business up to one-quarter of his gross receipts without losing his retail status under the Wage and Hour Law.

Fabricating Shops

Concerns that carry on actual manufacturing operations (including manufacturing to a special order) will not be considered retail establishments for the purposes of Section (13)(a)(2). Their employees will be covered by the Wage and Hour Law if the manufactured goods are sold in interstate commerce or are necessary to the production of goods for interstate commerce. But processing which is merely incidental to a retail sale (such as cutting and threading pipe for a residential heating system) will not defeat the exemption.

In some instances the line between manufacturing operations and the incidental servicing that is necessary to the installation of equipment is not easily drawn. It is a matter of degree and no hard and fast rule can be laid down.

Since the October, 1942, issue of AMERICAN ARTISAN carried a general discussion of the Wage and Hour Law as it affects sheet metal and related fields, the present article will confine itself largely to specific questions that employers have asked. Of course, this material is not all-inclusive, but it should help to clarify a number of points that have puzzled employers.

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Remembering that in general the Wage and Hour Law does not apply to employees engaged in the original construction of buildings, but does apply to employees engaged in the maintenance, repair, or reconstruction of buildings that are used to produce goods for interstate commerce, let us take up some of the problems.

Questions and Rulings

- Question 1: A Chicago dealer has sold heating appliances for installation in new homes, before these houses are sold. He also sold such appliances to contractors who are putting up homes on order for definite individuals. Are these sales considered retail sales for the purposes of Section 13(a)(2)?
- Answer: Sales of equipment which will later be resold, as in the first instance, are not considered retail sales. Sales to contractors who purchase appliances directly for a private individual will ordinarily be classed as retail sales.
- Question 2: If a concern is exempt as a retail establishment, are employees engaged in installing boilers, furnaces, and other equipment exempt?
- Answer: Yes, they would be exempt from the minimum wage and over-time provisions, if the establishment came within the Section 13(a)(2)

- exemption. But employees of a non-retail establishment would be covered if they engaged in the installation of apparatus or equipment (aside from construction material such as roofing, siding, insulation, and rock wool) which is sold after being received directly from another state pursuant to prior orders or arrangements.
- Question 3: A Michigan concern does considerable business with farmers in his part of the State, selling not only heating appliances but air control and other equipment for dairy barns, chicken coops and the like. Can these be considered retail sales?
- Answer: In the ordinary case, yes. But large scale transactions involving equipment not purchased by the average farmer would be classed as non-retail sales. Suppose, for example, that the Goldencream Dairy, Inc., is equipping a huge new barn and buys a quantity of sheet-metal fittings at a special discount from the price charged Mr. Average Farmer—the Wage and Hour Division would not regard the sale as a retail transaction for the purposes of Section 13(a)(2).
- Question 4: A Southern firm located near an expanding war plant sells cooking ranges for use in private homes and also furnishes such equipment to several restaurant proprietors. Are these retail sales?
- Answer: Again the proper classification of the sales for commercial use will depend on the type of goods involved. If the ranges are of the same size as ordinarily sold to the general public, and they are sold in the same quantity or at the same price, their sale would be considered retail.
- Question 5: From a Pennsylvania sheet metal contractor comes a query which should interest many firms that specialize in duct installations and air control. He does a good deal of fabricating for commercial installations and also does similar work for concerns in nearby New Jersey towns. What is the status of his employees under the Wage and Hour Law?
- Answer: The fact that some of the materials which he fabricates are sold in interstate commerce will bring this contractor's employees under the Wage and Hour Law. His employees also will be covered during weeks when they perform repair, maintenance, or reconstruction work for local (Pennsylvania) concerns that are engaged in interstate commerce or the production of goods for interstate commerce.
- Question 6: Does this mean that all of his employees must be paid in accordance with the minimum wage and overtime provisions?
- Answer: In general, yes. However, Section (13(a) (1) of the Act does exempt persons employed in an "executive, administrative, professional, or local retailing capacity, or in the capacity of outside salesman," as these terms are defined and delimited by the Wage-Hour Administrator.
- Question 7: A mid-western contractor who does a small amount of duct fabrication for firms in an adjoining state wants to know if there is any way that he can separate this work from his other activities which are not subject to the Wage and Hour Law.
- Answer: For purposes of enforcement, the Division considers each physically segregated unit as a

separate establishment. Therefore, this contractor might find it feasible to segregate his manufacturing for out-of-state customers by carrying on this work in a separate shop. He should remember, however, that if his office force (bookkeepers, stenographers, draftsmen and the like) is engaged in handling these out-of-state accounts, they, too, will be covered by the provisions of the Wage and Hour Law.

Question 8: An Eastern contractor who pays his office help on a salary basis wants to know how to cal-

culate the regular hourly rate of pay.

Answer: If employees are paid a weekly salary, the regularly hourly rate is determined by dividing the weekly salary by the number of hours regularly worked. If employees are paid bi-monthly or once a month, multiply these earnings by 24 or 12 to determine the employee's annual earnings and divide this total by 52 to determine the weekly rate of pay.

Question 9: Suppose salaried employees work an irregular number of hours during some weeks but continue to receive the same salary?

Answer: Where the hours of work fluctuate and the employee's weekly salary remains the same, his "regular" hourly rate of pay will fluctuate since it is computed by dividing his weekly salary by the number of hours actually worked each week.

Question 10: How is overtime calculated in such cases?

Answer: If the employee is covered by the Wage and Hour Law he will be entitled to time and one-half his "regular" hourly rate for all hours worked beyond 40 a week, and this rate will fluctuate, depending on the length of his workweek. Employers are cautioned, however, that such a method of calculation must represent a bona fide situation which the employee understands and agrees to. It may not be used as a bookkeeping device to avoid the payment of time and a half.

Question 11: An Iowa contractor with a customer in the adjoining state of Illinois instructs a manufacturer to deliver a heating plant direct to the customer. Is this a sale in interstate commerce?

Answer: Yes, such sales as well as drop shipments made in behalf of a contractor or dealer by a manufacturer, jobber, or other distributor, in another state are regarded as being in interstate commerce.

Answer: Yes, such deliveries, including drop shipments made in behalf of a contractor or dealer by a manufacturer, jobber, or other distributor are regarded as being in interstate commerce.

Question 12: A New York concern has a contract for air control installations in a war plant that is expanding. The side walls of the new addition are attached to the existing plant. Does this constitute original construction of reconstruction?

Answer: Original construction—the mere physical attachment of the walls of the new building to the old is not regarded as reconstruction *unless* the old building is itself remodeled, repaired or al-

tered in the process.

Question 13: From Rhode Island comes a rather tricky query. A plant that had been largely destroyed by fire was abandoned for some time. Then it was decided to rebuild, using the foundation and a small section of the old walls which remained. Was this work original construction?

Answer: In the opinion of the Division, the employees were engaged in original construction,

since the entire plant was reconstructed and use of the existing foundation and small remnants of the old walls formed and insignificant part of the whole job.

In another case, however, where fire demolished one building of an old plant, a new structure was erected on the burned foundations with walls immediately adjacent to the walls of another building and gathered support therefrom. The Division expressed the opinion that this operation involved reconstruction rather than original construction.

Necessarily the distinction in such cases is one of degree and employers who are puzzled by these borderline situations should consult the nearest field office of the Wage and Hour and Public Contracts Divisions.

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Question 14: The head of a California firm wants to know if the exemption granted to "executive" employees would apply to private secretaries receiving more than \$30 but less than \$50 a week whose duties involve the handling of highly confidential matters and data; the constant exercise of discretion and judgment; work predominantly intellectual and varied in character but involving at times considerable routine stenographic work similar to that performed by non-exempt employees.

Answer: In general the Division does not consider that such employees would qualify for exemption

as executive employees.

Question 15: What types of employees would be apt to qualify for exemption as professional em-

ployees?

Answer: Among other requirements for exemption as a "professional," the employee must have "knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study..." Employees who hold an engineering degree are paid not less than \$200 monthly, and engage in work requiring the constant exercise of discretion and judgment would likely come in this category. As a rule, draftsmen would not be exempt.

For the benefit of those readers who sell materials or equipment directly to the Federal Government, it may be well to summarize the provisions of the Walsh-Healey Public Contracts Act. This law applies generally to U. S. Government contracts for materials and supplies in excess of \$10,000. The Act fixes standards of minimum wages, overtime compensation, child labor and safety and health and forbids the employment of convict labor in the fulfillment of Government contracts above \$10,000.

Minimum Wages

The minimum wages under the Walsh-Healey Act are those which the Secretary of Labor has determined to be the prevailing minimum wage for specific industries and specific localities. So far such wage determinations have been made for some 56 industries with wage rates ranging from 30 to 70 cents an hour. Since there has been no wage determination applicable to the sheet metal fabrication and related fields, Walsh-Healey contracts for such materials will be subject to the 40-cent minimum fixed by the Fair Labor Standards Act under the recent wage orders.

Basic straight-time hours of work under the Walsh-Healey Act are 8 in any one day or 40 in any one week.

(Continued on page 101)

Manpower Commission War Appeal Procedure

(WMC Regulation No. 5)



ACHINERY for appeals by employees and employers from any War Manpower Commission action under employment stabilization plans, the 48-hour week policy and other manpower regulations are set up in Regulation No. 5.

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The new regulation prescribes who may appeal, actions from which workers may appeal, actions from which employers may appeal, notification of the right to appeal and officials or committees to whom appeals are originally taken. After decisions on original appeals, further appeals to the Regional Management-Labor War Manpower Committees and to the Chairman are possible.

Under Regulation No. 5, workers and employers, groups or organizations of workers or employers, and ther persons and organizations who claim to be prejudiced by any action of the War Manpower Commission may request a hearing upon the action.

Where there is an area Manpower Director and an Area Management-Labor Committee, appeals will be taken to the Area Labor-Management Committee. At the discretion of the Committee, hearings will be held before an Area Appeals Committee consisting of an equal number of representatives of management and labor selected by the Area Manpower Director from a panel chosen by the Area Management-Labor War Manpower Committee.

In such cases the Area Manpower Director or his representative will serve as a non-voting chairman of the Area Management-Labor War Manpower Committee at appeals hearings and of Area Appeals Committees.

In areas which are without an Area Director and an Area Management-Labor Committee, appeals will be taken to and hearings held before an Area Appeals Committee composed of an equal number of representatives of management and labor selected by the Regional Manpower Director from a panel chosen by the regional Management-Labor War Manpower Committee. A representative designated by the Regional Director will serve as a non-voting chairman of the Area Appeals Committee.

The regulations provide that original and subsequent appeals hearings shall be conducted informally and "in a manner that will best develop the facts."

Decisions on original appeals, the regulation provides, shall be made by the Area Appeals Committee or the Area Management-Labor Committee on the basis of evidence taken at the hearing. Decision by the majority of the Committee will be final unless the appellent wishes to appeal further, or unless the Area Manpower Director or other representative of the War Manpower Commission requests that the appeal be heard by the regional appeal body. In the event of a tie vote, the appeal will go to the regional body. Members of the committee may file majority and minority reports.

Further provision of the regulation permits an Area

Management-Labor Committee within the appeal period and prior to the filing of a further appeal to the Regional Management-Labor Committee to take jurisdiction of, hear and render a decision, which shall supersede any decision rendered by an Area Appeals Committee, on any case assigned by that committee

to an Area Appeals Committee.

Further appeals from original decision, under the regulation, may be taken to Regional Management-Labor Committees and hearings held by these committees or before a Regional Appeals Committee composed of equal representatives of management and labor selected by the Regional Manpower Director from a panel chosen by the Regional Management-Labor Committee. These committees may render decisions on the basis of the record or may schedule further hearings to be held before the committee if in the judgment of the committee further hearings are necessary. Regional Manpower Directors or their representatives will serve as non-voting chairman of the Regional Management-Labor Committees in appeals hearings and of Regional Appeals Committees.

Regional Management-Labor Committees may take jurisdiction of, hear and decide cases assigned by that committee to a Regional Appeals Committee in like manner as Area Management-Labor Committees can take cases from Area Appeals Committees.

Final appeal, the regulation provides, may be taken to the Chairman of the War Manpower Commission, and the Chairman may take jurisdiction over any appeal at any time and render a final decision.

Under the regulation, all appeals must be taken within such periods of time (not less than three days) following the date of the decision appealed from as the Regional Manpower Director may prescribe. The appeal period for appeals to the Chairman of the War Manpower Commission is the ten day period following the decision appealed from.

Further sections of the regulation provide that the appellant shall be given reasonable notice of the time and place of any hearing and shall be prompty notified of the decision; that he may be represented by any duly authorized person or organization; that chairmen of committees to which appeals have been taken may consolidate those raising a common question.

An appeal of an employer from a decision granting one of his workers a statement of availability in no way stays the effect of the decision so far as the worker is concerned, the regulation provides, but the officer to whom the appeal is taken may direct that subsequent cases involving other workers of an employer and raising identical issues may be suspended pending final settlement of the issue. There is a similar provision protecting employers who are satisfied with certain decisions from which workers may appeal. In all other cases the taking of an appeal stays the action appealed from, unless the Chairman of the Committee to whom the appeal is taken specifically directs otherwise.



U. S. Dept. of Labor Summary of

Overtime Pay Requirements

QUESTIONS arising under the mandatory 48-hour week (see March, 1943, page 37) for certain areas to release manpower for war industries produce this summary of those portions of the laws having a bearing on payment of overtime.

President Roosevelt's executive order establishing a minimum 48-hour week in the designated areas does not supersede or conflict with the Fair Labor Standards Act, the Walsh-Healey Public Contracts Act or any other Federal, State or local law on hours of work or overtime

The Fair Labor Standards Act requires basically that employees engaged in interstate commerce or the production of goods for interstate commerce must receive at least 40 cents an hour for all hours up to 40 each workweek and time and one-half their regular rate of pay for all hours over 40.

Employers of certain types of workers are, therefore, not subject to the overtime requirement. Among these are the following: Employees who are engaged in a bona fide executive, administrative, professional, or local retailing capacity or in the capacity of outside salesman. Also employees engaged in any retail or service establishment, the greater part of whose selling or servicing is in intrastate commerce.

In addition to the overtime pay exemptions under the Wage and Hour Law there are exemptions from the overtime pay as well as minimum wage requirements of the Walsh-Healey Public Contracts Act. This law sets forth the rates of pay and overtime under which supplies for the Government may be contracted for and produced, where such contracts are in excess of \$10,000.

The Public Contracts Act provides for the payment of minimum wages to covered employees. Differing slightly from the Federal Wage and Hour Law, it provides for the payment of time and one-half after 40 hours a week, or 8 hours a day, whichever amount is larger.

The surest standard of determining which employees were covered and which were not under the Public Contracts Act is the manner in which the work of fulfilling Government contracts is actually done. In general, those workers who are actually employed in the production of the materials or supplies are the covered employees. Exempt from the Act entirely, even though they are employed by the plants producing the materials, are office and clerical workers, supervisory employees and maintenance workers. The last includes such employees as electricians, elevator operators, watchmen, janitors, cleaners, other custodial employees and engine room employees.

Any employee who is exempt as an executive, administrative, or professional worker under the Fair Labor Standards Act is also exempt under the Public Contracts Act, but many workers who might be exempt from the provisions of the Public Contracts Act would still be entitled to the benefits of the Fair Labor Standards Act.

Payments for Holidays, Illness, Etc.

A further step toward uniformity in the overtime requirements under the Walsh-Healey Public Contracts Act and the Fair Labor Standards Act was announced March 1.

Under the new ruling, amounts paid employees for holidays not worked or sickness may not be credited against overtime due under the Walsh-Healey Public Contracts Act. The amounts paid for such hours not worked are not paid as overtime but for a variety of reasons—to reward employees for faithfulness, loyalty and length of service, to bolster personnel morale, to safeguard physical health and well-being of employees by giving them needed rest and relaxation and to conform to progressive business practice. Such amounts cannot therefore be credited to the overtime due under the Fair Labor Standards Act or the Public Contracts Act. This position has been consistently adhered to in interpretations under the Fair Labor Standards Act.

There is one exception; where there is evidence that part or all of the holiday compensation is actually intended to be overtime compensation instead of pay for hours not worked. This may be implied from the conduct of the employees in agreeing to work extra daily hours or weekly hours in return for time off on the holiday, and it may be implied or expressed in an agreement between the employees and the employer. If this is the case, of course, the situation is not one involving holiday pay as such but the usual one of overtime pay.

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Interpretations of Order No. 9240

Executive Order No. 9240 provides, among other things, that no premium wage or extra compensation shall be paid to any employee in the United States, its territories or possessions, for work on Saturday or Sunday except where such work is performed by the employee on the sixth or seventh day worked in his regularly scheduled workweek.

On February 17, 1943, the Secretary of Labor issued Interpretative Bulletin No. 1 in connection with Executive Order 9240 which became effective on March 1, 1943. We reproduce herewith some of the more important interpretative changes, as follows:

(1) It is now required that double time be paid for work on the seventh consecutive day of the employee's regular workweek only if all seven days fall in the same workweek. This constitutes a reversal of some previous interpretations. Under this ruling it would be possible for an employee to work as many as twelve consecutive days without the payment of double time, as long as he has one day of rest in each regularly scheduled workweek. (Section IV, paragraph 5.)

(2) A workweek is defined as consisting of seven consecutive days, starting on the same calendar day each week. Since a workweek necessitated by shift operations might not conform to this definition, the

last sentence of paragraph six in Section V makes it clear that the beginning of the work week may be changed, as long as no evasion of the Order is intended.

(3) The work day may consist of a particular 24-hour period, or the calendar day. If an employee works beyond his normal shift into the next work day, such excess hours are considered merely as part of his immediately preceding normal shift. Where, however, an employee so continues to work into his day of rest to the extent of one-half his normal shift, or is called to work on his day of rest, that day must be counted as a day worked. (Sec. VI, paragraphs 8 and 9.)

(4) The designated holidays must be counted in computing the seventh day, even though no work is performed. Idle holidays are likewise to be counted in computing the sixth day, unless the employment contract provides to the contrary. (Section VIII, paragraph 18.)

(5) Contrary to interpretations previously issued, Paragraph 23 of Section IX now provides that premium pay required for work on the designated holidays may not be credited or offset against overtime or premium pay required for any other day or portion of the workweek by virtue of the Order or other applicable laws. Both must be paid. This changes the established policy under the Wages and Hours Law, and the Walsh-Healey Act, of permitting premium pay to be credited, and clearly makes such premium pay an additional penalty, similar to double time required for the seventh day, neither of which can be credited under the Order.

(6) Where an employee is absent for a portion of a workday for a justifiable reason, that day must be counted in computing the seventh day, but double time for the seventh day may be paid only for those hours worked after the time lost has been made up by the employee. (Section X, paragraph 31 (2)).

The Wage And Hour Law

(Continued from page 98)

Overtime is permitted, of course, if time and onehalf the basic rate is paid for all hours worked beyond these limits. For example, an employee whose total workweek consisted of four 10-hour days would be entitled to 8 hours at time and a half under the Walsh-Healey Act, but under the Wage and Hour Law, which makes the workweek its standard, he would not be entitled to such overtime since his hours of work in that week did not exceed 40.

Heretofore the Walsh-Healey Act has generally prohibited the employment of boys under 16 and girls under 18 years of age. To facilitate war production a special exemption now permits the employment of girls between the ages of 16 and 18 years of age in any and all industries, but only if certain conditions are met. Employment is limited to 8 hours in any one day and the work period is limited to the hours between 6 a.m. and 10 p.m. Moreover, when State laws governing hours of work for women and children set stricter limits, then they must be met. No girl under 18 may be employed in any operation or occupation which under the Fair Labor Standards Act or under any State law or administrative ruling is determined to be hazardous in nature or dangerous to health; nor can she be employed at less than the minimum hourly rate set by, or under the Fair Labor Standards Act or the Walsh-Healey Public Contracts Act for the industry in which the exemption is granted. A specific and definite lunch period of at least 30 minutes must be regularly granted. Lastly, but no less important, the contractor must obtain and keep on file a certificate of age showing that the girl is at least 16 years of age. Failure to comply with any of these conditions will incur the \$10 per day liability for each person employed in violation. In some instances permission is also granted to employ these girls after 10 p.m. but not later than midnight when transportation facilities are scheduled to coincide with the shifts of the company which end at the later hour. But, they can only be so employed if authorization has been obtained from the Secretary of Labor. Those interested should obtain further information in this regard from the Wage and Hour offices.

How to Get New Workers

(Continued from page 87)

try. Both the young man and the untrained older man probably can be used in the plants of our manufacturers at work which requires a minimum of skill. The contractor, however, has neither the time nor the personnel to train men excepting apprentices operating under established apprenticeship training programs. This being so, the contractor will not be interested in the few remarks following on hiring unskilled labor.

Manufacturers who can use unskilled labor and must have a certain percentage of it, will find themselves, according to reports, in a "mean" labor market. It's "mean" because all war plants are scrambling for unskilled labor, which each plant proposes to train, and since many of these plants are operating under cost-plus-fixed-fee contracts, a few dollars additional cost does not mean as much to these plants as it does to a sub contractor or the producer of a civilian product.

It has also been reported frequently that our manufacturers can offer unskilled help a "beginners" wage rate which frequently is lower than the "beginners" wage of some local war plant. These rates are set by War Labor Board and, according to many reports, WLB has been pretty tough about permitting our manufacturers to raise their rates. WLB wants to keep beginners in war plants.

There are only a few sources of relief. (1) We can try kinds of persons not formerly hired (Negroes, women, students, etc.); (2) We can try to rearrange production so that our skilled men do all skilled jobs leaving odds and ends for lesser skills; (3) We can keep on petitioning WLB for wage increases to put us on a par with other local war plants; (4) We can solicit help through newspapers, etc., on the basis that ours is an industry which will boom after the war; (5) We can install a system of incentives which will increase the take-home check. Incentives have not been given blanket approval; may not even need approval, but just to be safe, any incentives plan we intend to follow should be submitted to the local WLB for approval.

AMERICAN ARTISAN, January, 1944

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Washington Letter



The Manpower Picture

O SEE the manpower picture as it appears here you must have the patience briefly to glance at some of the background. The Hill-Congress-and the people Downtown-Executive and Administrative Offices-assume, in a large way, the War "militarily" is won. The phrase "militarily won" literally is what they say. They mean there is no doubt about the eventual outcome, although the struggle may still be long and tough. To keep you up to scratch, gloom is the official line for public consumption. Russian victories are discounted; the effects of the bombing are belittled: much is made of what the Germans may have up their sleeves, and heavy emphasis is laid on the prognostication that the most savage days of the war are ahead. The armed forces are still growing in numbers, and the war labor forces continue to increase.

The War is different from the kind of war planned a year ago and production has shifted from one thing to another; but the stockpiles tend to curtail the overall need for some critical materials. The surplus of these materials, and the plants idle by reason of the shift in war production, have led WPB brass hats cautiously to plan a little more production for pinched civilians. War agencies, such as WPB, OPA, and the like, gradually are running out of war work. It is accepted as an unshakeably established fact that CMP and most of the regulations implied by war controls over industry and business will survive for a long, long time, after the war. Your children, and your children's children, undoubtedly will know the thing we call WPB and OPA, even though they do not know it by those names.

Gov't Take Over Business?

The thought you find current here was expressed tersely recently by Dr. Arthur Morgan, once head of TVA, who said: "Either business will take over Government, or Government will take over business." In either case the essence of the idea that is WPB and the rest of them will be necessary; and the consciousness of this need has led the longheaded individuals in the war agencies to shape the course to prepare these agencies for the post-war tasks. It is this forehanded purpose to preserve the agency that the agency may preserve the jobs that has caused the people who hold the jobs to place a stress on post-war planning out of keeping with the war situation itself, so far as the war situation has been revealed to us.

The consensus in the most reliable quarters is that Germany may wash out by next Fall. Other sober thinkers sincerely believe that only relative extermination will take the Germans out of the war. The war with Japan is regarded as considerably more forward than we know. But no one holds it as easy. It has been suggested the Japanese now have a population, a mixed population, of 200,000,000 from which they may call men up to 45 under arms. This potential manpower takes in the Javanese, the Malays, the Bumese, Siamese, Indo-Chinese, Formosans, and other geoples, who willy nilly come under the Japanese conquest. And bear in mind the distances in the Pacific are enormous.

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Freeze Every Worker in Job

With this Futuristic backdrop in view, it may be easier to understand the letters the President wrote to the labor unions: "We are reaching the period when new demands will be made upon labor to set aside their personal preferences in favor of the necessities of the country. The nation has reached the point when it is essential to stabilize the personnel and employment around any given plant, to reduce turnover and to keep the same people at the same jobs so far as is humanly possible. This will often mean considerable sacrifice to individuals, but this is the kind of effort which will be asked and which I know will be delivered by the workers of America once they know how vital it is, both to the war effort and to maintaining of reasonable balance to the cost of living."

This is regarded as a forecast of the purpose to ask for some kind of legislation to place more complete control upon the use of the nation's labor force. War Manpower Commission, not popular with Congress, on October 15 began an unequivocal program of rationing workers for all purposes everywhere. Presumably the program was to apply chiefly to skilled workers. Actually it applies to all kinds of workers. In effect a man or woman may work only where Government approves their employment; and industry and business must comply with Government regulations to secure help and to keep help.

WPB-WMC in Cahoots

A tight liaison has been formed between WPB and WMC. WPB's Labor Production Office polices plants, and when it finds what it deems defective utilization

of workers, it notifies WMC. Moreover, WPB then compels the plant to make its collective bargaining relations with the workers, and to adjust other production problems, to conform with WMC policies. WMC, in turn, forces the plant to comply with WPB requirements, including wage scales, by withdrawing its protection from the plant or the worker, if the plant or the worker are recalcitrant. When any existing condition restricts production or recruitment, WLB (which is part of WPB) will act jointly with WPB may certify the importance of a product; it may certify the importance of the relation of deliveries to the production schedule; it may certify the extent to which labor, not materials, limits pro-WMC will certify the nature of the manpower shortage, and that it cannot alone remedy the shortage, that wage increases are needed to recruit and maintain an adequate labor force. The interagency treaty is very detailed and specific, and provides that WMC will handle manpower problems with the National Housing Administration and the Office of Defense Transportation; on the other hand, WPB handles all problems involving materials.

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It is doubtful if the majority of employers realize the extent to which Government has placed controls upon the piecemeal relations between the worker and the man who provides the payroll. The Labor-Management Committees, over 4,000, have an increasing influence in the daily conduct of a plant. And naturally the Government through WPB has an increasing influence on the Committees. What the Unions think is not very clear. Both A. F. of L. and C. I. O., collectively claiming an aggregate membership of over 14,000,000 workers, have always been stiffly opposed to the labor draft. The heads of WMC, and allied Government agencies, thoroughly realize the strength of popular opposition, and have been very reluctant to sponsor legislation. Their position, like that of Congress, may be defined as an intense hope that legislation can be avoided, and that the policies and machinery in process of development on the West Coast may, welded with other programs, be used to secure all the effects of the unpopular labor draft legislation without enactment of the legislation.

Army Wants National Service Act

The Army is the spearhead of the open and forthright effort to secure the legislation. Not long ago James P. Mitchell, director, Industrial Personnel Division, A. S. F., War Department, in a formal statement said that labor problems "cannot be cured without a national service act. Such legislation is badly needed today. The War Department will continue to advocate a national service act as a basic essential tool, employed by every other major nation at war."

Mitchell's statement, obviously formulated with the approval of all the dominant heads of the War Department, also made clear that the Army thinks the facts of the labor situation have never reached the public. The assertion was made that the plans of the Army and Navy have never called for a total combined strength which would exceed 17% of the country's labor force. The War Department underlined this sentence: "The data clearly show the manpower available in the United States is more than sufficient to meet the needs of the armed forces, war production, and essential civilian production. The Chairman of the War Manpower Commission was right when he testified before Congress that there is no over-all national manpower shortage.

No Shortage — Just Mal-distribution

Here are some factors which contribute to the appearance that we do have one: The American people are not yet mobilized for war. A far smaller proportion of our population of working age is either at work or in the armed services than in any other major nation at war. A substantial reserve of idle labor, principally women, remains unused. In spite of this reserve, our civilian labor force during 1943 has remained below the level reached in 1942. New additions to the labor force have failed to match the withdrawals for the armed forces and the Census Bureau reported that in August the civilian labor force was 1,300,000 below what it was a year ago. We have hardly touched the vast reserve of potential war workers in non-war manufacturing, construction, trade and services, or in agriculture, which has increased its employment.

On balance these groups have changed little and have contributed virtually nothing to the war labor force. In other words, there has been virtually no net movement of workers from non-essential to war activity. The expansion in direct war activity has come almost exclusively from the unemployed and from new entrants into, or additions to, the labor force. Manpower is maldistributed. While there is enough labor available to meet all requirements, there are acute shortages in some areas at the same time that great surpluses exist in others. According to the latest classifications of WMC there are 193 important labor markets where 'current acute labor shortages exist' while there are over 100 important labor markets where 'labor supply is and will continue to be adequate to meet all known labor require-(Mr. McNutt told Congress by next July, 45 out of 50 of the nation's largest population centers, in addition to hundreds of medium and small centers, will be classified as labor shortage areas.)

More Efficiency Needed

The Army statement continues: "For instance, in California where much of our vital airframe industry is concentrated, there will be a shortage of 92,500 workers even after all potential reserves are used; but in Texas there is a net surplus of 182,000. The Army is a large consumer of civilian manpower. In June, 1943, we had 1,347,000 civilian workers in arsenals, depots, ports of embarkation, modification centers, etc., throughout the United States. By improvements in techniques and careful study of every job we have cut that figure by 144,000-more than 10%. Management and labor have already shown that a vast amount can be done to increase productivity. One aircraft company, making heavy bombers, reduced the number of manhours per bomber from 110,000 to 27,000 and is now producing four bombers with the labor previously required to make one.

"Changes are of infinite variety: shifts in plant layout; job simplification; upgrading workers; redesigning of machines; short cuts in transportation of materials, etc. Sometimes it was just a matter of improving morale, or improvement of quality. One firm can learn from another. The Ordnance Department has demonstrated the practicality of such technique in its government-owned, contractor-operated establishments, where exchange of information between the more and the less efficient firms has in some instances improved the latter's efficiency by as much

(Continued on page 207)

Shall I Buy Steel Sheets for Repair Under P-84 or CMP-4 or CMP-9A?

REPAIR and Maintenance Order P-84 was amended November 6 (announced in the December AA) and one of the changes took steel sheets to be used for repair and maintenance out of P-84 and placed them under CMP-4. In other words, under amended P-84, the contractor no longer buys steel sheets for repair by using P-84, but buys by using CMP-4.

This change raises an interesting situation which warrants clarification. The following is not an official ruling, but is ARTISAN'S opinion, based on information provided by WPB.

Before the amendment of P-84, if a contractor took a repair job and needed 2,000 pounds of steel sheets he made out his order to the jobber and placed on the order the certification provided in CMP Regulation No. 7 and gave himself an automatic AA-5 priority rating.

CMP-4 Builds Inventory

Now, under the latest ruling the contractor is supposed to take his sheets for repair out of his inventory and get his sheets for repair under CMP-4 by filing form CMP-4B. CMP-4B is filled in to show the total quantity of steel sheets or other controlled materials needed in each quarter by the contractor for repair purposes. WPB will approve this quantity of materials or will assign an allotment of materials and will give the contractor a priority rating to get these materials. The priority rating usually, lately, has been AA-4.

CMP-4 is in theory an inventory order—in other words a means by which a contractor or jobber can maintain inventory. The CMP-4 regulation permits a contractor to buy and a jobber to sell to one dealer, in one quarter, up to 20,000 pounds of carbon steel products (sheets).

Full Quota Can Be Stocked

As CMP-4 has been working out, a contractor may order the full quantity of 10 tons of sheets each quarter and place these sheets in inventory. He may use this 10 tons of sheets for either new work or repair work. Originally it was intended that this 10 tons of sheets under CMP-4 would not be sold by the jobber to the contractor all at once, but would permit the contractor to buy a few bundles of sheets from time to time up to the 10 tons in a quarter.

But as CMP-4 has actually worked out, sheets have been more plentiful than a year ago and so jobbers have been willing to sell contractors the full 10 tons in one order. In some cases jobbers have even asked contractors to take the full 10 tons. The result is the jobbers' inventories show complete depletion at the end of each quarter with large tonnages sold for repair, so the jobbers have been able to replace the sheets without too much trouble.

CMP-9A for "Rush" Repair

But effective November 25 a new order came into the picture CMP-9A (see full report in this issue). CMP-9A is a new repair order designed to make it easy for a "repairman" to obtain materials and parts in a hurry for maintenance purposes. Under CMP-9A a repair man (this might be a furnace dealer or a sheet metal contractor) can obtain for repair purposes each quarter up to 20 tons of steel sheets, 500 pounds of copper and 200 pounds of aluminum.

Also important, CMP-9A carries an automatic priority rating of AA-3 which is better than P-84's AA-5 or CMP-4's AA-4.

To get materials like sheets under CMP-9A, the contractor makes out his order to the jobber and places on the order the standard certification provided in Priority Regulation No. 7 and gives himself the AA-3 rating, automatically.

With this explanation the question becomes—should I get my sheets for repair purposes under CMP-4 or under CMP-9A?

This seems to be about the way the answer can be given—If the contractor does considerable repair work and tries to keep 2 to 10 tons of sheets on hand, he can get his sheets under CMP-4—placing the order and taking delivery on the whole 20,000 pounds each quarter and using the sheets for new work or repair. The chief problem is—will the priority rating given by WPB under CMP-4 be as good as the automatic rating of CMP-9A?

The answer probably is—no. So CMP-9A may be a better bet. It boils down to this—CMP-9A gives a contractor up to 20 tons of steel sheets each quarter and permits him to automatically rate his order AA-3 which is pretty good on sheets today. However, these sheets can be used only for repair—not for new work. Also, it is not intended that the whole 20 tons shall be ordered at one crack—instead, the contractor is supposed to buy a few bundles at a time until he uses up the whole 20 tons in a quarter. CMP-9A does not build an inventory. If the contractor prefers to operate out of an inventory, use CMP-4.

Use Both CMP-4 and CMP-9A

Perhaps the best suggestion is this—Try to maintain some inventory so that you will have sheets for new or repair work, but do not try to carry all through the quarter your full quota of 20,000 pounds of sheets. Then, supposing a rush repair job comes up and you have 5,000 pounds of sheets in stock, but need 10,000 pounds rush for the repair—get the 10,000 pounds by using the automatic AA-3 of CMP-9A and keep your 5,000 pounds in stock.

If the rush job takes only a few hundred pounds of sheets, take them out of your CMP-4 inventory and if at the end of the quarter you find you have used up more sheets than you applied for under the last quarter CMP-4, increase your request for the next quarter.

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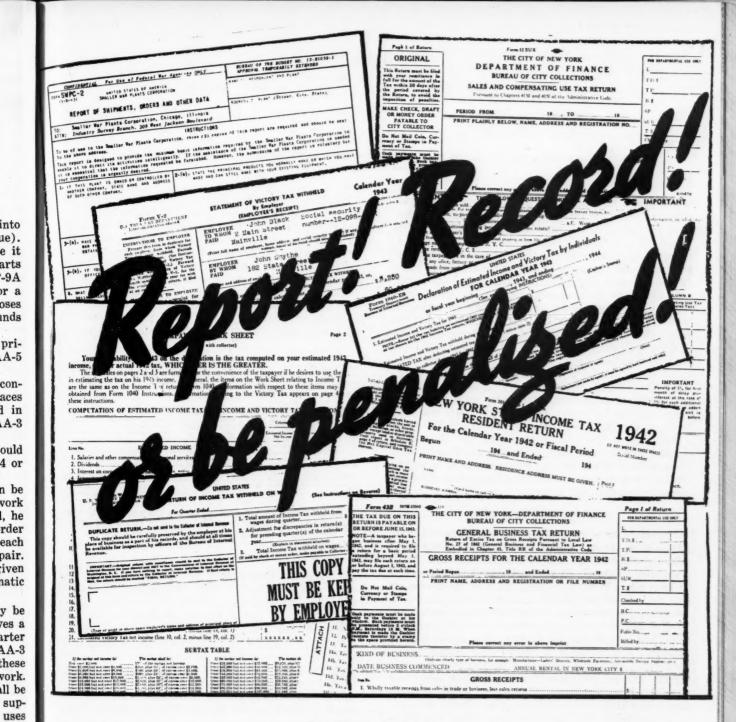
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By Arthur Roberts

■N PRE-WAR years, wise contractors kept "books" to record costs and profits. Contractors who didn't keep accurate records usually lost money, but the headache ended there. Today contractors who fail to keep accurate records may not only lose money but find themselves in expensive difficulty with Federal and State and municipal governments in the filing of reports and returns.

Even for the small contractors, accounting has become a serious business. Many are using systems that do not clearly reflect the required details, that increase the hazard of error and may bring penalties. In most cases the fault lies in the fact that the system is not designed to carry the load today, like an old heating plant that won't heat regardless of the quantity of fuel burned. For this reason, many accounting

systems in this field should be scrapped or reconditioned to make them suitable for the load they must carry today.

To get a clear perspective of accounting requirements today and in the postwar period, consider these phases of the problem.

1-Gross Income Control

This must assure the recording of gross income accurately for income tax, Federal and State, sales tax, excise tax on gross income, business tax and other state and municipal levies, also Federal Reserve Regulation W covering consumer credit and to show conformity with price control regulations.

Income is recorded in the Cash Journal and Sales Journal. To assure accurate recordings, separate col-

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FORM A

Date Co	ustomer	Item	Terms	Amt.	Sales Tax	Maturity date	Final payment	Trade-in	Financed by
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The post-war "Sales Journal" should have columns for entry of the details of installment sales under Federal Reserve Regulation W.

umns should be inserted to record installment sales, sales tax and other taxes on cash and credit sales that have sprung up in the past few years. Under Federal Reserve Regulation W, furnaces, air conditioning systems, oil burners, stokers, attic ventilating fans and gas conversion units are salable at one-third down and 12 months' maturity. Your records should show that you adhere to such regulations. In the event of a trade-in, the cash down payment shall be one-third the net price of the article after deducting from the cash price the amount allowed for the trade-in. The books of original entry should reflect compliance. For example, the entries in the Sales Journal, sometimes called Sales Register, should be expanded to something like Form A. shown above.

If you have many installment sales, open an installment register for recording such sales only with the heads as shown in the foregoing Form A.

An auditor checking your books can determine quickly whether you were selling in compliance with Federal Reserve regulations, whether you were within the law on sales tax, etc. So could you when the time comes to prepare your returns.

2-Payroll Control

This must show compliance with the Wage and Hour Law, excise tax on employers of eight or more individuals, withholdings and other Federal and State deductions. Payroll control begins with the time card or time slip (Form B). The total time as shown on this card should be checked against the time shown on job tickets to determine that all time is accounted for on jobs and charged to customers. Any difference is shop time or other nonproductive labor and should be charged to a separate account listed under "overhead" and not under direct job cost so that the contractor has a knowledge of nonproductive labor and can keep it at minimum. With labor scarce and demand plentiful, nonproductive labor should be at a minimum today, but there may come a time when con-

FORM B
Time Slip

Name—Jol	n Black		Dept.		WP		
Date	In	Out	In	Out	от	ST	от
1/3/44	8:00	12:00	12:30	5:30	1	8	1
1/4/44	8:00	12:00	12:30	5:30	1	8	1
1/5/44	8:00	12:00	12:30	5:30	1	8	1
1/6/44	8:00	12:00	12:30	4:30		8	
1/7/44	8:00	12:00	12:30	5:30	1 .	8	1
1/8/44	8:00	12:00				4	
Total l	nours					44	4

WP shows that Black works on war production, a sub-contract obtained by Smythe. All war production work should be decartmentized on the records.

Wages are computed from time slip and entered on payroll egister.

ditions lean the other way; then this operating expense should be watched carefully. If the contractor has no time clock or time stamp to record labor time, he should make entries by hand. A time recording device is a desirable acquisition to your payroll system.

Form C (next page) shows the "payroll register" to handle modern requirements. Say that Contractor John Smythe has 10 men, 2 men working full time on a war product sub-contract. He must report tax withholdings to government and state, show compliance with wage and hour regulations, pay an excise tax to

U. S. TREARING DEFARTMENT LINEAR DEFARTMENT LINE

Form W-4 should be demanded from each employee to show his withholding exemption. Use to fill in employee's status on the "Payroll Register" (Form C).

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the Treasury Department and probably deduct for war bonds and stamps. The old style payroll system, with this load to carry, is costly and inefficient. Form C gives you an idea how you can combine the work easily on one sheet.

Take the entry shown for John Black. Smythe pays him \$1.25 per hour, time and a half for overtime. The week beginning January 3 he worked 44 hours straight time, 4 hours overtime, giving him a wage of \$55 for straight time and \$7.50 for overtime, which was entered in detail on the payroll form as shown. Black is married with 1 dependent, entitling him to a marital exemption of \$24 weekly and \$6 for the dependent, \$30 in all.

D. S. TREASUL	m W-1 RY DEPARTMENT BYENUS SERVICE	For Overier Ended. Marc	WITHHELD ON WAGES	ORIGIA
me and to the breturn, made in	est of my knowledge an good faith, pursuant to der authority thereof.	7, that this return has been examined by d helief is a true, correct, and complete the internal Revenue Code and the regu- Smy the	Total amount of Income Tax with wages during quarter. Adjustment for discrepancies in for preceding quarter(s) of the year. (Explain in attainment atta.	return(s) e calendar
	Owner	,	3. Total Income Tax withheld o	n wages \$ 840
(Date)	(Owner, presiden April 14	, partner, mereber str.)	4. Penalty \$	CASHIER'S STA
_	John Si		5. Interest 8	
	Mainv	tate Street	Bulo Gearler Ended:	
(Type or print i	is above apare resplayer	name and address of principal place of	Master List No. 1	30-07101

At the end of each quarter, Form W-1 is filed with the Treasury Department. This shows the total amount withheld—you need not show employee's names.

FORM C Payroll Register Year 1944

Name-John Black Address-Main Street, Mainville Social security number—12-098-62X Withholding exemption—\$30 Victory Tax exemption—\$12 Department—War production

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Type work—Sheet metal worker Date employed—Feb. 5, 1941 Wages—\$1.25 straight time Overtime—Time and half Payroll period—Weekly

Employment terminated— Form W-2 to employee— Form W-2 to tax collector—

Days Worked	Straight Time	Over Time	Total Time	Total Earnings	IW DE	FOA	S FROM SU	WAGE VT	S Bond	Total Deductions	Net Wages	Check No.
Jan. 3-8	44	4	48	\$62.50	\$6.50	.62	.62		\$5.00	\$12.74	\$49.76	175

Some payroll forms list hours worked daily. The time card gives this information so need not be duplicated. Eliminate duplicate recordings wherever possible. File time cards alphabetically for easy check-back.

Record on this form the date when Form W-2 is given to employee and when mailed to tax collector. This is the statement of income tax withheld on wages. For the calendar year 1943, you must send duplicates of Form V-2 "Statement of Victory Tax Withheld" given employes who terminated employment before income tax withholdings began. Victory Tax and income withholdings are now combined on the W forms.

IW-Income Withholding; FOA-Federal Old Age; SU-State Unemployment; VT-Victory Tax.

Forms obtainable at stationery stores provide for 52 listings or 1 year payroll recording for employee. Additional columns are provided on these forms in the event you have other withholdings to deduct than those shown here.

This information is shown on his payroll sheet and was taken from the employee's withholding exemption certificate, Form W-4, which Black had to make out to guide his employer in determining the tax to withhold. This form specified Black's exemption.

Straight time and overtime brought Black \$62.50, from which \$30 is exempted from tax, leaving \$32.50 to be taxed; 20 per cent of this sum is \$6.50 for income withholding; 1 per cent of the total wage for Federal Old Age Benefit was then deducted, 62c; and 1 per cent for state unemployment, 62c, also \$5 for bonds, making \$12.74 in withholdings, leaving \$49.76 as the

Smythe may pay Black in cash, but he had better pay by check, detailing deductions on a perforated stub, which Black can tear off for his record. Contractor Smythe's check stub should record the same information. In this way, employer and employee have a clean-cut record of the transaction to minimize subsequent controversy. Form D shows one type of check. Do not draw one check to payroll and then pay employees with cash.

Where payrolls are large, some concerns do draw

checks to payroll to segregate these payments from other financial transactions, but they deposit such checks in a special account and then draw individual checks to employees against it. The contractor need not go to this trouble. Just pay each employee by check, recording its number on the payroll register.

Now that Contractor Smythe has Black's money and that of his other employees, what will he do with it? If you deduct less than \$100 a month, you may hold it and remit quarterly to the Treasury Department. If you deduct more than \$100 monthly, as Contractor Smythe does, you must deposit the tax before the 10th of the following month in a designated bank in your community and get a depository receipt. Every quarter Uncle Sam wants a return so you send the depository receipts for the first two months and your own check for the third month before the last day of the month following the close of the quarter, accompanied by Form W-1 (United States Return of Income Tax Withheld on Wages). Just fill in the total amount of taxes withheld; employees' names are not listed.

Form E is a summary payroll sheet that will enable you to simplify the work on these quarterly returns

1485 Jan 8 62 50 62 62 6 50 6 50 5 U DANAL DED. 62 12 74

49 76

AUSTIN SHEET METAL WORKS =1485 DOLLARS USTIN STATE BANK 2-112 CHICAGO, ILL. 2-112

This type of check pays employee John Black and gives him a detailed record of wages and deductions on the stub which Black keeps as his record. Contractor Smythe's stub stays in the check book and shows identical data plus balances brought forward, commercial discounts and other entries.

49 76

FORM E

Payroll Summary Sheet Year 1944

	Payroll	Deposit	Date	Depository Collector	Bonds
\$50	\$575.80	\$134.20	1/8		
	\$50	\$50 \$575.80	\$50 \$575.80 \$134.20	\$50 \$575.80 \$134.20 1/8	\$50 \$575.80 \$134.20 1/8

Minimum trouble will be experienced with withholdings if your routine is clean-cut. Deposit deductions in a special account to the penny. If you use your regular bank account, make separate deposits of withholding and separate deposits of bond deductions TO THE PENNY so that you can identify these sums easily for check-back. For example, John Smythe deducted \$134.20 for the week of January 3-8, so he deposited this money in a special account and enters the deposit under "Bank Deposit."

Before the 10th of the month following (February), Smythe will draw a check on this account for the January withholdings to the penny and give to a bank in his community designated to receive withholdings, at the same time entering the amount of check drawn under "Depository." He receives a depository receipt, which he puts in the safe. Comes the end of March, the first quarter, Smythe's report is due in the Collector's office before the end of April, so he takes the total under "Tax Deductions," fills out Form W-1, sends the 2 depository receipts he received for the first 2 months and his own check for the last month, listing his check under "Collector." No individual wage payments need be given, just the total deductions.

Bonds are a separate transaction. You may keep this money with tax withholdings in the same account, but earmark it with a separate deposit slip so that you have a separate entry on your bank statement. When an employee has paid for a bond, draw a check against the account and enter the withdrawal under "Bonds."

You can prepare this form yourself on a standard columnar bookkeeping sheet, which will suffice for 1 year. Adjust the headings to suit requirements. This form gives you an idea how you can keep your withholding transactions systematic.

In a convenient space on this form enter the date or number on depository receipts and the date Forms W-1 and other tax forms are mailed. Check this summary sheet against the bank statement monthly.

Returns and payments on social security tax are also made quarterly, likewise, state unemployment compensation. When due, draw checks for the totals shown on this sheet and enter amounts under "Collector," making a notation in a convenient place of the mailing dates and tax form numbers.

just as Form C simplifies the work on annual returns. Using Form E, you can make payments on withholdings, social security, state and other levies quarterly, also reconcile the yearly total with withholdings and the bank statement if deductions are deposited in a special bank account, which is advisable if they run into money.

If you do not use a summary sheet you may have a more difficult time making quarterly returns and reconciling the payments with your records at the end of the year because you must make numerous mathematical calculations to combine the records for employees. If you have so few employees that this will not take much time, you may eliminate Form E.

Payroll forms of this kind may be bought in most stationery stores. Select a form that best suits your requirements. If you have a big personnel and the turnover is high, you may find a sheet listing employees in consecutive order more desirable than using an individual sheet for each employee, but most contractors, like Smythe, with a comparatively small staff working regularly, will find an individual record of each employee's withholdings most desirable because he must report the annual wages paid each employee, and if he merely lists the names one after the other on a payroll sheet, he must go back over 52 weeks and total the wages for each employee he has the total ready to give the government after the year is over.

Incidentally, you will notice that Smythe has no Victory Tax withholdings to report on Black (Form E), but this does not mean that the Victory Tax deduction is discontinued entirely. If Black had five children instead of one, he would be entitled to exemptions of \$24 for his marital status and \$6 for each dependent, \$24 plus \$30, or \$54. If Smythe paid him

\$55 for straight time in one week the taxable sum for income withholding would be only \$1, or 20 cents at 20 per cent.

Here the Victory Tax comes into the picture. It is computed on withholdings at 3 per cent on the excess of \$624, the exemption given everyone on this tax, so the employee would pay 3 per cent on \$43, the difference between his Victory Tax exemption of \$12 weekly and \$55, or \$1.29. Where the Victory Tax computed this way runs higher than the income withholding computed after deducting exemptions, deduct the former.

Now Smythe has deducted the tax, duly recorded it, and made three quarterly returns. The year ends. One more return, the last quarter, is due by January 31 of the following year. With this final quarterly return (Form W-1) Smythe must send duplicates of the "Statement of Income Tax Withheld on Wages" that he must give each employee on Form W-2 and also make a reconciliation of quarterly returns with the statements given employees. This reconciliation is made on Form W-3. We suggest that you make inquiry immediately for W-3 because if your books are kept in the old-fashioned way you may have difficulty compiling the necessary data, so don't wait until the last minute.

If an employee leaves, give him a report of his wages and deductions to date on Form W-2, keep a copy and file subsequently before January 31 of the following year with Form W-3.

Annual information returns on Forms 1096 and 1099, formerly required on employees for wages paid, are discontinued where tax has been withheld from wages, but if you pay interest on notes, rents, etc., totaling \$500 or more, you must file information returns on or before February 15.

FORM W-2 TREASURY DEPARTMENT DITIENAL REVENUE SERVICE	By Employer (EMPLOYEE'S RECEIPT)	Calendar Year 1943
TRUCTIONS TO EMPLOTER report this form in deplicate for members from whom a tux has withheld. Furnish original before. Forward duplicate with rea of Income Tax Withheld en a., Form W-1, for the fourth	EMPLOYEE John Black Social Section of PAID Main Street number=12=(Print full name of complete, home offerer, and social security number, if	98-62X
rer of the year (or with the em- er's final return, if filed at an for date). (See Circular WT.)	EMPLOYER John Smythe BY WHOM 182 State Street Mainville (Name and address of employer)	
his is your receipt for In- ee Tax (including Victory c) withheld. You should g it for use in preparing r Income and Victory Tax	STATEMENT OF INCOME TAX WITHHIELD ON W	
orn for 1943, and as evi- ce of tax withheld.	Amount of income tax withheld	\$ 338.00

At the end of each year contractor Smythe must give each employee Form W-2 showing total wages paid and total tax withheld. W-2 should be made in duplicate so the duplicate can be sent to the Treasury Department with W-3.

Social Security Returns

Social security deduction for employees is still 1 per cent and probably will remain so, although it was to be "upped" last year. Deduct 1 per cent until you receive notice otherwise. Return for these deductions must be made quarterly, the same as withholdings, on Form SS 1-A. This return comes under the Federal Insurance Contributions Act, which imposes an employers' tax of 1 per cent upon wages paid by each employer and an employees' tax of 1 per cent upon wages received by each employee.

If you have eight or more employees on a total of 20 or more days during the calendar year, each such day in a different calendar week, you must file an annual return under the Federal Unemployment Tax Act on Form 940 on or before January 31 of the following year with the Collector of Internal Revenue,

BHAL REVENT	W. Nov. 1946) ARTMENT UR SERVICE			TAX RETURN	READ	INSTRUCTION!	
"otal taxab "otal taxab "otal taxab redit or ac otal emple % of Item redit or ac	employees list ide wages PAI EASP 2	ted in Schedul D (see lee 2) PLOYERS' T/ 7.50 PLOYERS' T/ 7.50	\$ 750.00	13. I revow (or offern) that I be used that to the best of a certificate in the state of the certificate in the state of t	before me	this da	
	oyees tax		. 7.50	If paid by check or money order able to "U.S. Collector of laters	r, make pay- [ER'S STAMP
		s 5 and 8)	\$ 15.00		al Revesue."		er's stamp this space for seal
THECATED	N 16	***		12. Date quarter		(The see one	tititi space for seat
345	Mainv1 628976	e Stree		Total tax 8. Penalty 8. Interest 8. Total 8.			
Joh	-	0		TAXABLE WAGES PAID TO E his regar wars paid during the queries unaries granted 3/31/4-	(m)	Traban bank	enough space to flat s r, use Schedule A co (Form 88-1 b). Enc t show a page numb number 2. (See instru
1	82 Stat	e St e 28976	thomas of principal pieces	16. Total pages of return, back 16. Her a change of ownership the quarter? — Course 16 of Instructions.	ding continue , or other tra- If m,	nion electric sites	Vienning Committee
Em	ployae's Account	Number	Nome (Ty	of Employee pe or print) (180	Tunals Under P	in Wagus Faid otheral Exercises ributions Aut (XB)	Obato CB60
600		0000			Deline		
	098	62X	John Black		\$750		. 00.0 m/m way delike day a symmet
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TOTAL R	OR THOU PAGE		ble wages paid.				This total most
TOTAL R	OR THOU PAGE	IIS RETURN	ble wages paid. —Total taxable wages pa		750 1750		This total must be the same as line 2 above

If contractor Smythe had only one employee this would be his filled in SS-1A. An entry must be made for each employee, showing wages paid each, their social security numbers. Note under contractor Smythe's name his Social Security identification number.

FORM W-S
U. S. TREASURY DEPARTMENT
INTERNAL REVENOR RESIDEN

Reconciliation of Quarterly Returns of Income Tax Withheld on Wages (Form W-1) With Statements of Income Tax Withheld on Wages (Form W-2 and Form V-2)

	Calendar Tear 1943		
	Taxpayer		
1	(Name of stupleyer)	leafru	ctions
	(litret midran)	on Re	10100)
	$\{U(t_2) \qquad \qquad (S(t_2))$		
1. Tor.	AL NUMBER OF DUPLICATE STATEMENTS OF INCOME TAX WITHHELD ON WAGES (FORM W-2 AND FORM V-2) TRANSMITTED HEREWITH		
	AL INCOME TAX WITHHELD ON WAGES AS SHOWN BY STATEMENTS OF INCOME TAX WITHHELD ON WAGES (FORM W-2 AND FORM V-2)	3,400	_ (A)
	AL INCOME TAX WITHHELD ON WAGES AS SHOWN ON LINE 3 OF EMPLOYER'S RE- TURNS OF INCOME TAX WITHHELD ON WAGES (FORM W-1):		
	Quarter ended March 31 900		
	Quarter ended June 30		
	Quarter ended December 31. \$1,000		
4. Tor		3,400	(B)

At the end of the year, Form W-3 must be sent to the Treasury Department to show total income tax withheld on all employees. Send duplicates of all W-2's with W-3. Total of W-3 must equal total of all W-2's.

the same as the final return on withholdings. The taxpayer may credit against the tax the amount of contributions paid by him with respect to the calendar year under all State laws which have been approved by the Social Security Board: Provided no credit may be taken for contributions under a State law if such State has not been duly certified for the calendar year. The term "contributions" means payments required by a State law to be made into an unemployment fund by any person on account of having individuals in his employ, to the extent that such payments are made by him without being deducted or deductible from the remuneration of individuals in his employ. Amounts in excess of the first \$3,000 paid for services are excluded.

Smythe, with 10 or more employees, is subject to a tax under the Federal levy, and throughout the country the same Form 940 is used by employers with eight or more employees. But the Social Security Act established a cooperative Federal-State system for unemployment compensation and each State administers its own unemployment compensation law, using different type reports and having different requirements. In some states, employee and employer contribute; in other states only the employer. Find out from your State Unemployment Compensation Board what your obligations are in this respect. We believe that in most states returns are made quarterly, the same as income withholdings. Remember that even

/ 10	-	
TREASUR	DEPAI	TMENT

READ INSTRUCTIONS CAREFULLY

ANNUAL RETURN OF EXCISE TAX ON EMPLOYERS OF EIGHT OR MORE INDIVIDUALS
UNDER THE FEDERAL UNEMPLOYMENT TAX ACT

FOR CALENDAR YEAR 1943

FILE THIS RETURN WITH THE COLLECTOR OF INTERNAL REVENUE FOR YOUR DISTRICT NOT LATER THAN JANUARY 31, 1944

	John Smythe	For use of Collector only No.
	(Name of outpayer)	Amount Paid, S
	(If individual or partnership, trade asses, if used) 182 State Street	(Castler's examp)
-	Wainville (Fost office) (County) (Sinds)	******
Nature of business, in Check (y') form of or Date of organisation	detail WARM air dealer and sheet motal c gamination: Corporation: Partnership; XIndividual: Cother March 3, 1914 Was a return filed for 1942? X	(Spacify, mith as estate, trust, etc.)
Less: Total nontax	se, and other remuneration PAID during 1943 for services of employees able remuneration paid. (From Schedule A.—Must be explained in separate statement attached as a part hereof)	

Form 940 must be filed as shown in the heading. There are many more questions—all must be answered. Form 940 is used only by employers of 8 or more employees.

FORM H

March, 1942, Ratios (Pct.)
Sales
Labor Cost
Material Cost
Overhead
Net Profit

	SA	LES	LAB	OR COST	1	MATE	RIAL CO	ST	oy P	ERHEAI ro-rated		NET	PROFIT	1	TAX	
Month Ending	This Month	12 Mos. to Date	This Month	12 Mos. to Date	Pet.	This Month	12 Mos to Date									

Form H (suggested) is a cumulative statement showing month by month how costs (labor, materials, overhead) are comparing with sales volume and net profit. Watched month by month, the employer can determine from Form H just where the business is heading and what to do to hold profits.

though you have fewer than eight employees and need not file a *Federal* return on Form 940, you may have to file under your State unemployment compensation law, and this law may apply if you have only one employee.

You can see by now that merely the payroll end of your tax work involves plenty of detail, that your system must be up to snuff to do the work accurately. Every detail must be recorded for easy check-back by government auditors or your own staff—quarterly payments to the Collector, monthly deposits in bank, depository receipts, deductions, wage payments, all require systematic handling. To guard against penalties you should have a tax calendar showing the dates when returns are due. Also a tax file, in which place all matters pertaining to tax recordings.

Some employers in the past have banked social security deductions with their own funds, using the tax money in their own business until quarterly payment time. This tax, at 1 per cent, is small, but now with income withholdings and other taxes, it is wise to segregate tax deduction funds in some way so that you do not use them in business, otherwise it may be difficult to get the money when Uncle Sam wants it and that would be a bad fix to be in. The payroll summary sheet (Form E) provides for the opening of a special bank account for withholdings and reconciliation with the bank statement on deposits and withdrawals. When making tax payments, draw all checks against this account. Deductions for bonds may also be put in the special account.

At this writing we do not know whether the Victory Tax will be repealed. There is talk about it in Washington. At any rate, deductions for Victory Tax were discontinued, in most cases, when tax withholdings began in July. However, if you have Victory Tax withholdings to report, you must include them with your quarterly returns on income, also in the final return after the end of the year, and give each employee a record of Victory Tax withheld when employment terminates or after the end of the year the same as on income withholdings.

Should an employer prefer to deposit tax money for an entire quarter with the local depository instead of making such deposits for two months, then sending the Collector a check for the last month in the quarter, he may do so, in which case he mails the three depository slips with his return.

3-Profit and Loss Control

The purpose of this record is to keep the tax on profits ratio in sharp focus throughout the year. Form H is a cumulative statement of operating ratios, which gives an immediate appraisal of business movement for the past year and shows how your business is heading. It should be prepared for each department, for war production work, and for the business as a whole. The totals are taken from the monthly profit and loss statement and give information which that statement does not supply—the ratios of the cost of labor, materials, overhead, margin and net profits to sales for the past 12 months. The high tax rate makes such close scrutiny necessary.

As the year travels on, a quick computation will tell you how much tax will be deducted from net profit to give you an idea of pocket-profit. It is dangerous business today assuming that your net profit is your spendable profits and spending accordingly only to find on tax payday that you have a big tax to pay and no money to pay it with. Check income against the tax rates. You may be approaching the border to a higher tax rate. Computation may show that if you keep below the borderline you will net more pocketprofit. In other words, the more business you may do. even at profitable prices, may net you less spendable income. You may find that you must step up volume considerably to provide a reasonable spendable income for the year. Most contractors forgot their income tax until March 15 in prewar days. Now and in the postwar period you must check the tax rate with your other business ratios.

This statement will also help you determine whether you are living up to price ceilings. Under the law, your pricing method is frozen as of March, 1942, and you should keep a record on hand for anyone to examine. If you used a spread of 40 per cent at that time on estimates, you must use that same percentage today. If the margin and net profit on Form H run higher, you should check back to make sure your estimates are priced properly. The March, 1942, ratios are good guides to check against until price control is removed because deviation from these ratios may indicate that your estimates or flat price jobs are being sold for more than ceilings unless you have decreased the overhead ratio to provide the increased net profit. Show your March, 1942, ratios on this form.

[Part 2, discussing "Stock Control", "Incoming Cash Control", "Departmental Control" with suitable forms, will appear in the February issue.]

CMP-9A — New Repair Material Order

ROCEDURES under which persons engaged in the business of making repairs may obtain controlled materials and other materials and parts have been established in a new CMP Regulation No. 9A.

The new CMP Regulation No. 9A permits persons operating heating shops, farm machinery repair shops, blacksmith shops, and electricians, plumbers, and others engaged in any type of repair work, to buy up to 20 tons of carbon and alloy steel (sheets, strip, shapes, tin, terne) a total of 500 pounds of copper and copper base alloy brass mill and foundry products, and 200 pounds of aluminum in specified forms and shapes in any calendar quarter.

The regulation permits repairmen to buy as much other material as they need for maintenance and re-

pair work.

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To buy materials and parts under CMP Regulation No. 9A, a repairman must put a certification in substantially the form shown in the order on his orders.

Repairmen who do work for persons who have the right to use an AA-2x or higher preference rating to buy non-controlled materials and parts for their own maintenance and repair, may use their customers' ratings to buy what they need for repair or maintenance work or to replace inventory used for such purposes.

If a repairman, industrial or other, requires more controlled materials in a quarter than he may get under Regulation No. 9A, he should fill out and send to WPB in Washington, a Form CMP 4B. WPB may then allot additional controlled materials and assign him a preference rating. However, if a repairman gets an allotment, he may not use the provisions of CMP Regulation No. 9A to purchase controlled materials, non-controlled materials or parts.

The regulation specifically prohibits repairmen from fabricating repair parts that they intend to sell to others, rather than use themselves, with the materials that they obtain under the procedures it establishes.

Deliveries of materials may not be accepted if the inventory of the repairman accepting such deliveries would become in excess of a 60-day supply, except in the case of copper wire, with respect to which the inventory limitation is 15 days.

It should be pointed out, perhaps, that there is no connection actually between the amended CMP 9-A and CMP-4 (the jobbers order). CMP-9A permits the repair shop to buy 20 tons of sheets per quarter for repair purposes and gives a CMP allotment symbol of V-3 plus a preference rating of AA-3 and this order must be filled by the jobber under the terms of CMP-4 whereas under CMP-4 the jobber may reject an unrated order which is what a CMP-4 order for repair materials would be.

Also, under CMP-9A the contractor may buy sheets from which to fabricate warm air pipe and fittings, but may not buy a furnace which is not a controlled material and should now be purchased under L-79. You may also buy prefabricated pipe and fittings if you can find a supplier who will sell because manufacturers are permitted to make up pipe and fittings for repair and manufacturers get the materials under their manufacturers CMP application.

Following are excerpts from CMP-9A:

PART 3175-REGULATIONS APPLICABLE TO THE CONTROLLED MATERIALS PLAN [CMP Reg. 9A] PARTS AND MATERIALS FOR REPAIRMEN

§ 3175a CMP Regulation 9A-(a) What repairmen can buy materials and parts under this regulation. Anyone in the business of making repairs may buy materials and parts under this regulation. This includes such persons as farm machinery repair shops, blacksmith shops, electricians, radio repair shops, plumbers, refrigeration repair shops, boiler repair shops, motor rewinders, electrical contractors, automotive repair shops, upholstery repair shops, bicycle repair shops, and carpenters. It also includes repair shops which are owned by the persons for whom the repair work is done if that person can segregate the purchases of his repair shop from his other pur-

(b) How much materials a repairman can buy. Each calendar quarter a repairman may buy, under this regulation, up to 20 tons of carbon and alloy steel, a total of 500 pounds of copper and copper base alloy brass mill and foundry products, and 200 pounds of aluminum, in the forms listed in Schedule I. A repairman may buy as much other material and repair parts as he needs for his maintenance and repair work.

(c) How to buy materials under this regulation. (1) When buying materials and parts under this regulation a repairman must put on his order a certification in sub-

stantially the following form: CMP Allotment Symbol V-3; Preference Rating AA-3 The undersigned purchaser certifies, subject to the penalties of section 35 (A) of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or orders to place this delivery order, to receive the items ordered for the purpose for which ordered, and to use any preference rating or allotment number or symbol which the undersigned has placed on this order.

He must sign the certification himself, or as described in Priorities Regulation No. 7. An order for controlled materials bearing this certification is an authorized controlled material order under all CMP regulations.

(2) If a repairman does repair work for persons who have the right to use a preference rating higher than AA-3 to buy non-controlled materials and parts for their own maintenance, and repair, the repairman may use that rating to buy what he needs to do their work or to replace in inventory what he has already used for that purpose.

(d) How a repairman can get more controlled materials. (1) If a repairman needs to buy more controlled materials a quarter than he can get under this regulation including what an industrial repairman can get under paragraph (1), he should fill out and send Form CMP-4B to the War Production Board, Washington (25), D. C. The War Production Board may allot him controlled materials and assign him a preference rating. If he gets an allotment, he may not buy any controlled materials or noncontrolled materials or parts under this regulation.

(e) What kind of work a repairman may do with materials or parts bought under this regulation. A repairman may use what he buys under this regulation only to do maintenance and repair work. He may not use what he buys to make products, such as repair parts, which he does not expect to use himself in making repairs.

(f) Restrictions on inventory. A repairman may not accept delivery of any item of parts or materials bought under this regulation if his inventory of that item of parts or materials is or would by accepting delivery become larger than he needs to continue his repair and mainte-

(Continued on page 198)

Interpretations, Amendments, Easements Jo Existing Orders

Furnace Liners Are Permitted

In THE September, 1943 issue, we reported the furnace liner controversy in which WPB said "No metal liners permitted" and FHA said "War house furnaces must have a liner or equivalent insulation." And in the December, 1943 issue, we presented FHA's definition of "equivalent insulation." As of December 1, however, there had been no final decision made on liners for war housing.

Now the argument has been settled. We are going to have metal liners in furnaces for new war housing and cast iron smoke curtains, feed door liners, shaker

handles.

But the wording of the amendment prevents manufacturers furnishing metal liners with furnaces to be used for replacement. The assumption is that dealers will take the liner out of the old furnace and use it in the new furnace casing. Carrying this further, the status of the situation now seems to be that when a dealer orders a furnace he must specify and show on his order where the furnace is to go—new war housing or replacement—and, accordingly, the manufacturer will ship a liner or no liner.

Here is the wording of the amendment announce-

ment—

"Carbon steel inner liners for new furnaces installed to heat new buildings or additions to old buildings were permitted December 9 by the War Production Board in an amendment to Order L-22, Furnaces.

"A previous amendment to Order L-22 prohibited the use of metallic casing inner liners because it was believed that substitute materials could be used for this purpose. It has since been found that non-metal-

lic substitutes are not readily available.

"The revised order also permits the manufacture of feed door smoke curtains, feed door inner liners, hot blast lift doors and upright shaker handles from cast iron. Previous restrictions prohibited their manufacture from any metal, but an increase in the supply of cast iron makes the change possible.

"The provision of Order L-22 which restricted sales of furnaces to orders carrying an A-10 or better preference rating has been eliminated, since Order L-79 controls distribution of metal plumbing and heating equipment including furnaces. An A-10 or better rating is also required under L-79 for the delivery of furnaces."

Sale of Frozen Materials

RIORITIES Regulation No. 13, governing special sales of idle and excess materials, has been revised, and as revised special permission to sell idle and excess controlled materials for any permissible use under WPB orders and regulation may be granted by the regional offices of the WPB. Permission may be granted for sales of such controlled materials either to persons who have no allotments or to persons who have allotments but desire to acquire controlled mate-

rials in excess of the amounts included in the allotments which they hold.

In cases where such special sales are authorized, the buyer need not certify that he is entitled to the material under CMP allotments nor need he deduct the amount of materials so acquired from his allotment account.

In the case of copper or copper base alloy, such permission may be granted by the Regional offices only if the buyer has an allotment and an authorized production schedule for the product which he intends to manufacture from the excess or idle materials which he will acquire. Used material is no longer subject to restrictions on sales under Priorities Regulation No. 13, unless List A, attached to it, specifically indicates that used materials shall be so governed. The Regulation also eliminates provisions which have been applicable to the steel which was reported to the Steel Recovery Corporation. Formerly, it was not possible to sell such steel in the absence of specific permission from the Steel Recovery Corporation, or the various regional offices of WPB. Inasmuch as Steel Recovery Corporation has been liquidated, it is no longer necessary for such permission to be obtained prior to selling such steel. The provisions have therefore been eliminated from the Regulation.

New Burners for Old

DOMESTIC type oil burners over ten years old or those beyond repair may be replaced restriction-free from dealers' stocks, the War Production Board announced January 4. In other replacement cases, however, the prospective purchaser must obtain approval from the district WPB office on Form WPB-1319.

Replaced burners must be scrapped or dismantled. Previous restrictions required that all installations of the Class B burner ordinarily used for heating homes be approved in advance by WPB's Plumbing

and Heating Division in Washington.

The revised order (an amendment to Order L-74, Oil Burners) also frees dealer's stocks of oil burners for new installations provided that the Petroleum Administration for War has approved in writing the delivery of fuel oil for such a burner on the premises in question.

Delivery of Class B burners from manufacturers' inventories or production of new burners of this type are still subject to advance approval from WPB in

Washington on Form WPB-2727.

Under the revised order dealers and distributors are free to sell or deliver any Class B oil burner to another dealer or distributor for resale. Previous restrictions required WPB approval before such transactions could take place.

Class A and Class C oil burners, which include most industrial and pot type burners, may be delivered only on orders bearing a preference rating of AA-5 or

higher.

Furnace Price Raise Ruling

THE recent 9 per cent increase authorized in manufacturers' sales of steel warm-air and cast-iron furnaces applies *only* to the furnace proper and does not apply to any auxiliary equipment, OPA said December 2.

The manufacturer may increase his lowest list price on a complete furnace oil-burner unit, a stoker-furnace unit or a gas-furnace unit only on the selling price of the furnace itself (including casing and grates) even though his price sheet lists ceiling prices on the

complete unit.

For example: A manufacturer lists a furnace oilburner unit including an oil burner, blower, filter and controls (auxiliaries) for \$400. The furnace itself lists for \$100. The manufacturers' selling price for the unit may be increased by \$9.00 (which is 9 per cent of the list price of the furnace itself), establishing a new ceiling price of \$409 for the complete unit. He may not increase his price by adding 9 per cent of the list price for the entire unit (9 per cent of \$400 or \$36) to establish a ceiling price of \$436.

Selling prices for others than manufacturers of the furnaces and units shall be sellers' ceiling prices at the time of the effective date of the action pertaining to the particular type of furnace or unit, plus the actual dollar increase in cost to them of the furnace

itself.

(The foregoing provisions were contained in Amendment No. 18 to Order A-1 under section 1499.159 b of Maximum Price Regulation No. 188 pertaining to steel warm-air furnaces effective November 2, 1943; and Amendment No. 9 to Order A-1 of Maximum Price Regulation No. 188 pertaining to cast-iron furnaces, effective August 4, 1943.)

Burner Service Prices

OFFICE of Price Administration through a revision of its supplementary regulation covering oil burner services makes clear to suppliers which of several specified service charges they may use.

Oil burner service suppliers generally operate on either an hourly rate or per-call basis. Under the revision, per-call operators whose present rates under the Services Regulation (MPR 165) are either less or greater than those established by OPA September 23, 1943, in the oil burner service regulation now have the choice of retaining their present per-call rates or converting to an hourly rate basis not to exceed that established in September, 1943.

The new action also provides that (1) rates for the first hour may be charged for any portion thereof, even though the actual working time consumed is less than one hour, (2) charges for the second or succeeding hours must be computed on the basis of 15-minute periods, rounded out to the nearest 5 cents, and (3) rates established apply to each mechanic or service

man employed on the job.

Another provision makes it clear that the new regulation does not apply to suppliers who sell oil burner service under a seasonal or yearly contract or to sellers who first sell or offer to sell services on or after the effective date of this revised regulation.

The revised regulation delegates to the regional administrators and district directors authority to apply the rates for any city to an area which, in the judg-

ment of the field officer, should take the city rate. This is necessary, OPA said, because of the many large cities surrounded by populous suburban communities that normally have had the same level of rates. The field officers also are authorized to suspend the regulation in any area they believe such action can best serve price control.

Today's action is found in Revised Supplementary Service Regulation No. 19 (Oil Burner Services), ef-

fective December 15, 1943.

Omitted Furnace Parts Prices

M INOR reductions in maximum prices of warm-air furnaces from which certain parts have been omitted by manufacturers in accordance with War Production Board limitation orders are announced by the Office of Price Administration.

These parts, ranging in price from 5 to 60 cents, include such items as auxiliary doors, handles, dampers and pokers. The reduction in price, when any of these parts are omitted from a complete furnace, applies to shipments by manufacturers, either for civilian or Government use, and will be reflected in prices

paid by consumers.

The cost of the specified parts omitted will be deducted from the manufacturers' maximum net price. One uniform set of deductions has been established to apply to all manufacturers of warm-air furnaces. Each company will use the listing of parts as contained in today's provisions to account for all of the parts omitted from his own particular furnace or furnaces.

Resellers' prices for warm-air furnaces have been controlled by the provisions of the General Maximum Price Regulation. Inasmuch as each reseller had to establish his price on new articles under the GMPR, for simplicity and administrative expediency today's amendment has been made applicable to all sellers. Consequently the lower net prices will be reflected to the ultimate consumer.

Parts specified in the amendment and the amount to be deducted for each follows:

Feed door smoke screen 10 cents Feed door lining 20 99 Hot blast lift door ,, 5 Wire coil handle 10 Water pan 50 Inner lining for casing 60 Upright shaker handle 55 Poker 15 Metal check damper 20 Hand-control draft regulator

(Amendment No. 21 to Order A-1 Under Section 1499.159b of Maximum Price Regulation No. 188 (Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Goods Other Than Apparel), effective December 16, 1943.)

Warehouse Sale by Fabricators

A FABRICATOR who does not have a ware-houseman's status under War Production Board Supplementary Order M-21-b may not charge warehouse prices for the plain material which he sells. The sale of such material is subject to Regulation No. 204 (Idle or Fozen Materials Sold Under Priorities Regulation No. 13).

On Our Industry's Front

Simplified PD-IX Coming

WHOLESALERS and retailers, who use Form WPB-547 (PD-IX) to apply for priority assistance in obtaining scarce goods, are cautioned not to order supplies of this form for more than immediate needs, says War Production Board. A simplified version of PD-IX is under consideration, and is being submitted by the Wholesale and Retail Division of WPB to appropriate Industry Advisory Committees.

The new form, if adopted, will require less time to fill out and less time to process at the War Production Board. Any changes will be made public well in advance of the effective date, probably some time in

January.

Warm Air Furnace Distribution

ITH a view towards effecting a more equitable distribution of civilian furnaces in 1944, Warm Air Furnace Industry Advisory Committee members, at their recent meeting in Washington, recommended the elimination of uprating from AA-5 to AA-4 on emergency orders. It was pointed out by Committee members that the validity of an emergency claim is difficult to determine and uprating of such orders may result in one distribution point being given an advantage over others. Continued uprating of AA-5's to AA-4's may result in severe area shortages, committee members said. When AA-5 ratings are uprated, producers' schedules are disrupted and distribution is unbalanced. Some distributors and jobbers may receive more than their fair share of furnaces. Use of Form PD-IX should not be discontinued, however, since consumers who have no source of supply can use this method for obtaining furnaces, but only an AA-5 rating should be awarded, the committee recommended.

Distribution of furnaces for replacement purposes in accordance with actual furnace use, based on past sales and installations, is the goal for furnace dis-

tribution in 1944.

In addition to discussing distribution problems, committee members heard a report by a representative of WPB's Labor Production Division who informed the committee that an attempt had been made to obtain relief for furnace manufacturers. Information on twenty plants, which represent the greatest percentage of the industry's business, indicated that 13 are located in No. 1 or No. 2 labor areas. Some of the larger companies; however, are located in No. 3 labor areas. Only 5 of the 20 plants indicated a need in excess of 100 workers to maintain production at the present level. These five plants are in critical labor markets where the possibility of expansion is slight because of competition with war industries. The turnover is very high in these plants-10 to 20 per cent a month.

In response to an invitation to comment on the current labor situation, committee members presented their individual problems and explained how they had attempted to meet them. In most cases it was found that skilled labor presented no great problem but that common labor was extremely hard to get and to keep. Some members indicated that by hiring more colored

labor, by using women as sheet metal workers, and by offering training courses with a view towards upgrading they successfully reduced absenteeism and labor turn over. Cooperation from local offices of the U. S. Employment Service and the War Manpower Commission was considered helpful by committee members.

In response to a request for information on the new CMP procedure, Mr. Morgan Johnston of WPB's Plumbing and Heating Division explained that under the new plan applications will be divided into two classes, large and small cases. Those applications requesting 149 tons or less of carbon steel during a given quarter are considered small cases. Small cases have been processed in Washington on a yearly basis and will be sent to the field offices for future action. All interim applications for additional material should be sent to the governing field office.

Large cases, those requesting more than 149 tons of carbon steel during a given quarter, will continue to be processed in Washington on a quarterly

basis

Price Increases

OFFICE of Economic Stabilization has announced a program for insuring adequate production of essential civilian goods to be effectuated jointly by the War Production Board and the Office of Price Administration.

Primarily, these changes will result in a greater equalization of profit margins for all products and price lines of individual consumers' goods industries when such action is needed to improve production of essential items. There is also provision for special handling of price controls affecting marginal producers, and affecting producers whose current profits are at excessively high levels.

The policy statement incorporates two major principles on which will be based any future joint operations of the two agencies in formulating programs for production of essential civilian goods. These are:

1. The War Production Board is responsible for formulating plans and programs to assure needed volume production of essential civilian goods. When WPB finds that existing price regulations "constitute a serious impediment" to fulfillment of the programs, certification to this effect will be made to the Office of Price Administration.

2. OPA is empowered, under certain conditions, to revise existing price schedules as a production stimulant, but in every case pricing formulas spelled out in the policy statement must be adhered to as a preventive against inflationary or uncontrolled price increases.

Both WPB and OPA actions under the program are subject to review and approval of the Director of Economic Stabilization.

When WPB certification is made to OPA that price regulations operate to hinder production of products essential to the consumer economy, OPA may, with the approval of the Economic Stabilization Director, allow price increases beyond "the minimum requirements of law."

This provision is surrounded with several specific standards on which any price revisions must be based.

The standards will (1) prevent excessive profits; (2) assure production from marginal as well as more efficient producers; and (3) provide for a more equitable spread of profit margins.

When price increases are permitted on an individual producer basis, the following standards will prevail:

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- 1. For the producer whose current profits from alloperations are no more than double those earned during the 1936-39 base period, or who is operating at
 a loss: With OPA authorization, he may increase the
 price of the item for which increased production is
 needed to an amount not to exceed the total unit production cost plus a profit not to exceed 2 per cent of
 that cost.
- 2. For a producer whose profits from all operations are more than double those earned in the 1936-39 base period: OPA may set a price ceiling not to exceed the total cost of making the item for which increased output is indicated. In other words, producers with "exceptionally high" profits will be required to produce needed consumer goods and to sell them at cost.

These standards will also prevail when varying price increases are granted for group of firms, or between groups of firms and individual firms making the same product.

When uniform-price increases—in amount of percentage—are needed to obtain industry-wide assistance in production of a given item, it is stipulated that the

rate of increase shall be based on the production costs of the highest cost producer. If increases are permitted, the highest cost producer (whose output is needed) of the item involved will not be permitted to set his price in excess of his direct production costs. Prices of other producers will be pro-rated to this.

More Private Housing

ANSURED financing for approximately 100,000 additional family dwellings to be produced by private builders under National Housing Agency's war housing program is made available by President Roosevelt's recent approval of legislation increasing the Federal Housing Administration's war housing mortgage insurance authorization by \$400,000,000.

The legislation expands the FHA's insurance authorization under Title VI of the National Housing Act to \$1,600,000,000 from \$1,200,000,000 and extends the FHA's authority to insure under that title from July 1, 1944, to July 1, 1945.

The amendments also extend the FHA's authority to insure mortgages on existing houses under Title II to July 1, 1946, from July 1, 1944, and extend the authority to insure repair and improvement loans under Title I to July 1, 1947, from July 1, 1944.

M-21-b-2

BAYONNE STEEL PRODUCTS CO. of Newark, N. J., is sending to its dealers the following explanation of Order M-21-b-2:

Effective October 1, 1943, deliveries of Steel Merchant Trade Products: Galvanized Sheets (Flat or Corrugated), Wire (Plain Black or Galvanized, also Barbed), etc., will be subject to the revised provisions of Preference Order M-21-b-2.

Paragraph "H" of the order reads as follows:

RESTRICTIONS ON PLACING ORDERS BY DEALERS. Dealers may purchase merchant trade products for stock only as follows:

- (h) (1) On or after October 1, 1943, a dealer may order for stock all merchant trade products sold since April 1, 1943, in accordance with C.M.P. Regulation No. 4, provided that such material sold has not already been replaced or ordered for stock replacement. Dealers' orders for stock replacement may be placed with wholesale distributors or with any person other than a producer. A dealer does not have to reorder the same merchant trade product he has sold, but can order an equivalent tonnage of the same or any other merchant trade product. No dealer shall use any delivery from stock to support a stock replacement order more than once.
- (h) (2) It is not necessary for a dealer to extend individually the allotment numbers, CMP symbols, farmers' certificates or other valid certificates received from his customers in order to establish an authorized controlled material order with his supplier. To establish such an order the dealer must sign the following statement on the purchase order which he places with his supplier.

"The undersigned hereby certifies to the seller and to the War Production Board, subject to criminal penalties for misrepresentation, that the material covered by this order is to replace in stock merchant trade products of the same weight delivered by me from stock in accordance with C.M.P. Regulation No. 4, after March 31, 1943, and not previously ordered for replacement. This constitutes an authorized controlled material order."

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Any order so endorsed shall be considered an authorized controlled material order.

Our interpretation of this order is as follows:

After October 1, 1943, the dealer may order from us any of these products provided he has sold them out of his stock from April 1, 1943, to October 1, 1943, subject to Regulation CMP No. 4 and they have not been replaced.

We would suggest that the dealer total the weight of all these items sold by him in this period and deduct the weight sold on priority orders which have been extended by him to his supplier.

An order endorsed with the Certification shown can then be sent to any wholesale distributor, such as ourselves, for all or any part of the weight regardless of whether the material was originally bought from that distributor. All sales made after October 1st can be replaced by any order bearing the Certification either with the same material or an equivalent tonnage of some other Merchant Trade Product.

For a period of two years, the dealer must maintain records to support the orders placed and also have inventory figures for each fiscal year.



Post-War Should Be a Period of Expansion

By H. P. Mueller, President, N.W.A.H.&A.C. Ass'n

WHILE the production of the Furnace Industry has been widely curtailed since the active advent of war, and while we have been faced with serious changes in our economic and governmental structure, the Furnace Industry is certainly not in the doldrums. The demand for heating equipment is greater than ever before, and this demand will accelerate as months of continued low supply and increasing need go by.

Obviously, the type of home building permitted today is not to be compared with the home construction of the post-war world. As we enter the period of transition back to normalcy, we will find an unprecedented market for furnace replacements and will likewise find a market for new and improved products for the home of tomorrow.

We Must Offer Improved Heating

While we extend ourselves to the limit in applying our engineering and management talents toward furthering the war effort, we must concentrate every bit of the remaining supply of energy in the direction of improved heating comforts for the home owner.

This responsibility of providing the nation at large with improved heating rests with all of us and we must accomplish this in the simplest and the most practical fashion that is possible.

You have seen, and you will continue to see, a great deal of glamorous advertising about the improvements to be gained through modifications of various types of heating other than forced air. Our own industry cannot and will not sit idly by without constructively advancing and promoting new ideas for improvements in our particular kind of heating.

Research Must Be Extended

There is no industry in the country that has so methodically and carefully attacked the research problems that have confronted it and so successfully solved these problems as we. The development of good installation practices through our research program at the University of Illinois has been one of the outstanding achievements of this Association. The entire staff is to be commended for its efforts. The responsibility for the enforcement of these installation standards rests upon us.

To do this, the complete cooperation of the entire industry will be essential. Let us set as a basic ob-

jective the establishment of such momentum within our industry in the promotion and application of warm air heating by our customers that the program will accelerate of its own inertia.

The disorganization of our normal economic picture obviously implies that a reorganization will shortly become necessary. Let us reorganize methodically and progressively and let us begin to reorganize immediately so that we will not only hold our ground against competitors in the heating industry, but against other industries as well in obtaining the largest possible portion of the post-war markets which will soon exist.

Post War Problems

Our immediate task is to defeat our enemy. We predict many years of good business after this war has been won but, by the same token, the winning of the peace will bring with it many problems and many economic changes. Millions of men will be returned to civilian life, countries in which battles have raged must be rebuilt, populations over many parts of the earth rehabilitated, and to industry will fall the responsibility of finding the solution to many of the difficulties which will confront the entire world. Serious labor problems will be with us, competition will be keener because production facilities have been vastly expanded by the necessity of war. These are but a few of the many problems to which we must find answers.

Our own industry must get its house in order. Vicious price cutting tactics are unhealthy. As a result of the war, we have learned not only the value but also the absolute necessity of maintaining sound accounting methods. Proper cost finding procedures will be essential if we are to survive post-war conditions. Selling prices must be on a basis in which reasonable profits can be achieved by each and every member, small or large, of not only this but every other industry.

Gov't Must Be Taken Out of Business

American business, because of the present emergency, has been, for all practical purposes, actually operated through governmental directives. We should be in a position to aid in the effort to remove all such

(Continued on page 206)

RESIDENTIAL AIR CONDITIONING

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SECTION



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

DIVIDENDS of DEPENDABILITY

OIL CONTROL VALVES



A-P Constant Level Oil Control Valve with Fuel Compensator. Standard equipment on most leading oil burning appliances.



A-P Model 240-ED Thermostatic Heat Regulator Set—for automatic temperature control.

A-P Model 240-Q, Type U Temperature Limited Furnace Control.

... Accurate Fuel Control

Description Be sure your new oil burning furnaces and heaters benefit by the "dividends" of A-P DEPENDABILITY in fuel control accuracy... advantages proved in thousands of homes today enjoying the heating convenience and economy of gravity-fed vaporizing type oil burning equipment.

A-P research engineers are ready now to assist you on new control developments for your post-war appliances... controls that will enable you to capitalize on new knowledge, new advances made in automatic fuel control devices that will add greater convenience, increased efficiency, assurance of continued customer satisfaction and powerful selling advantages in your new products.

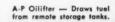
Send us your plans for new oil burning furnaces, heaters, ranges, hot water heaters, and any other products that may richly benefit by the kind of knowledge, skill and craftsmanship available to you at A-P. We promise a profitable solution to all types of control problems.



AUTOMATIC PRODUCTS CO.

2452 N. THIRTY-SECOND ST. . MILWAUKEE 10, WIS.

A-P Complete Furnace Control Set for alltypes of gravity-fed Oil Burning Furnaces.





A-P Thermostat, with "Heat Anticipator."



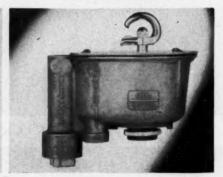
A-P Model 240-WUR Thermostatic Water Heater Control.



A-P Constant Level Valve for Trailers and Mobile units.







FPHA's Heating Correction Guide

Many heating men have prophesied that in much of our war housing unsatisfactory comfort must result because of the open construction and because no-recirculation, single returns and other sub-code specifications must result in cold floors, wide temperature differentials, high fuel costs. What we prophesied has happened. Following is NHA-FPHA's solutions—we present them to familiarize contractors with the suggested changes and because the same solutions will probably correct many private similar installations.

LAST heating season complaints were received with respect to unsatisfactory heating, which complaints indicated conditions in the field more or less common to projects of similar type and construction. Therefore, it was believed that a survey could be made which would reveal the causes of such dissatisfaction and permit developing solutions to the problems.

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About August 1, several heating consultants were engaged to conduct the investigation, each covering a definite number of projects and requiring that their assignments be completed by September 1.

The object of this circular is to summarize the conditions contributing to the heating difficulties and to set forth the probable solutions.

In concert with the consultants, all the conditions which were traceable to causing heating difficulties were summarized and solutions determined. It may, under certain conditions, be impractical from structural or economic standpoints, to completely correct the conditions in line with the recommendations.

The survey confirmed the obvious fact that a heating system, good or bad, would not render satisfactory service unless properly attended. In other words, before large expenditures of money are made to correct apparent heat discomforts, it is necessary that operators (project or tenant) be conversant with correct methods of firing and the application of controls. The Management Standards Division is preparing for early issuance an operating guide titled "Instructions for Tenants for Firing of Coal Burning Equipment."

The survey also indicated that to a large extent unsatisfactory heating was traceable to improper sizes and grades of coal used in connection with the installed equipment. It is, of course, assumed that in the case of project operated plants, the fuel best suited for use in connection with the installed equipment is selected. In the case of tenant operated equipment, it is recommended that the tenants be advised as to the size and grades of the available coal best suited for use in connection with the installed equipment. Where gas fired equipment is installed, it is recommended that the local gas utility company be invited to cooperate in the adjustment of the equipment to suit type and pressure of gas available.

With fuel rationing in effect in some areas, and high fuel prices or scarcity of fuel prevalent in other parts of the country, economy of fuel consumption is very much more important than it has been in the past. Even though there have been no definite heating complaints on a project, it may be desirable to remedy deficient construction or to add insulation or storm protection for the purpose of conserving fuel.

Procedure for Correcting Work

The regional offices should immediately circulate copies of this report to all projects where heating has been reported unsatisfactory. Upon receipt of the report at the project, the difficulties which have been experienced on the specific project should be checked against the "Heating Correction Guide" in order to determine on the probable causes. The project may find that not all of the causes listed are applicable. They should then determine whether or not the solutions in Bulletin No. 56 are in their particular case structurally and economically sound to make.

In the attached Bulletin there are set forth certain items pertaining to the safety of the project. It is mandatory that these items be corrected.

It is to be noted that frequently a number of recommendations are made as solutions to a specific cause of unsatisfactory heating; only such of the recommended solutions as may be necessary to correct the unsatisfactory heating condition on a specific project should be applied.

Inspection should be made to see if any of the unsatisfactory conditions which might arise are attributable to contract noncompliances; in this case, correction should be demanded from the contractor. Where projects or parts of projects are not occupied and where early occupancy is not anticipated, but which require corrections which have to be made at Government expense, such corrections should be deferred until the units are to be occupied.

Changes shall be made either under the requirements of existing contracts (if the trouble can be traced to contract violations) or under separate contract at Government expense, or a combination of both, depending upon the circumstances.

Priority assistance as necessary will be supplied for procuring critical materials involved.

Costs

As soon as an estimate of the cost of the work can be made (this should not include costs for which the contractor or manufacturer is liable) regional offices should prepare and submit Form 501 to the Central Office for necessary additional funds if required.

Forced Warm Air (Project Operated)

(Non-recirculating System)

1. Crawl space open.

(a) Enclose space (not only is the enclosure considered desirable to keep floor warm but also to act as a relief plenum—see Item 2). See Illustration No. 1.

2. Lack of circulation within dwelling unit.

(a) Provide relief outlets by either of the following methods:

1) One story wood floors: Locate outlets in floor, under windows, discharging into crawl space (provide floor type register).

2) Second floor of two story dwellings and all dwellings with concrete slab: Provide vertical duct with opening at floor relieving into roof space; locate duct at closet near outside door. See Illustrations No. 2 and 3.

Excessive temperature differential between floor and ceiling.

(a) Extend supply outlets to floor (this will be generally *not* required for the +15 degree heating zone). See Illustrations 2 and 4.

4. Inadequate storm protection.

(a) Provide storm doors and windows (except for +15 degree design temperature).

(b) Provide ceiling insulation to give "U" factor of 0.08 (this should be done in all heating zones).

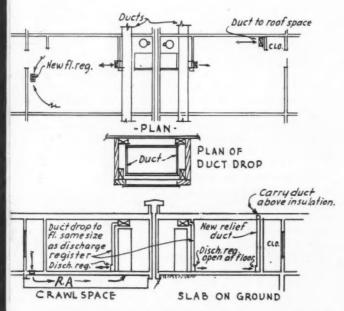


Fig. 2—Non-recirculating systems, over a crawl space, lacking circulation, should have a new closed return as shown, left. Over slabs, vent rooms to attic (right) from return at floor level.

5. Uneven heating between rooms.

(a) Provide adjustable scoops or deflectors extending into duct work. See Illustration No. 5.

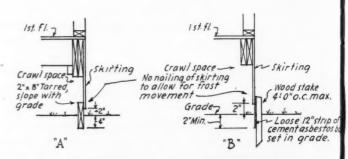


Fig. 1—Cold floors, over open space, should be "winterized" by enclosing the floor-ground space. Note skirting is free of ground strip which may move under frost.

6. Insufficient air at supply outlets.

(a) Increase fan speed by changing or adjusting pulley on motor (may require change to larger motor).

(b) Fresh air intake to have wire protection mesh not smaller than $\frac{1}{2}$ inch.

(c) Attempt operation without filters unless ex-

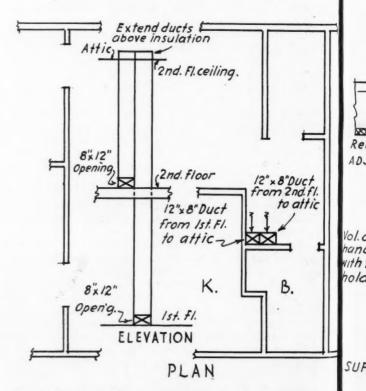


Fig. 3—Non-recirculating, two-story houses, can obtain circulation by venting both floors to the attic from returns at the floor.

cessively dusty conditions necessitate their use. (If filters are found to be necessary, use throw-away type and replace at least three times a season.)

- (d) Provide separate fresh air intake for each furnace (this should only be done in extreme cases, particularly where necessary to retain filters and where evident that a fan in operation withdraws air from a wing controlled by another fan not operating). See Illustration No. 6.
 - (e) Keep access panels to blower closed.

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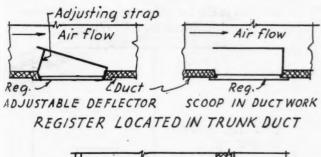
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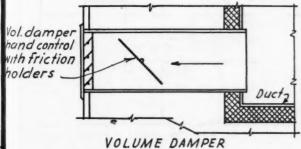
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- 7. Excessive temperature drop between air temperature in duct where it leaves furnace and air discharge temperature at last supply outlet.
 - (a) Where temperature drop exceeds about 35 degrees F., duct work will require additional insulation.
- 8. Duct work unworkmanlike, reflected by sagging and open joints.
 - (a) Make joints mechanically tight and provide additional supports where required.
- 9. Frequent periods of overheating and underheating.
 - (a) In general, regulate system so fan operates practically continuously, fan being controlled solely by bonnet fan switch. Locate bonnet switch on duct work near bonnet.
 - (b) Set low point of bonnet fan switch as low as practical without causing relatively cold air.
 - (c) Disconnect room thermostat when system is coal, hand fired.

10. High furnace room temperature.

(a) Cover with insulation warm air duct work in furnace room and also top of furnace bonnet.





SUPPLY REGISTER EXTENDED FROM TRUNK DUCT.

Fig. 5—Where uneven room temperatures cannot be corrected with dampers or registers, "scoops" in the duct will increase air delivery (above) or new dampers in stubs can reduce volume where excessive delivery occurs.

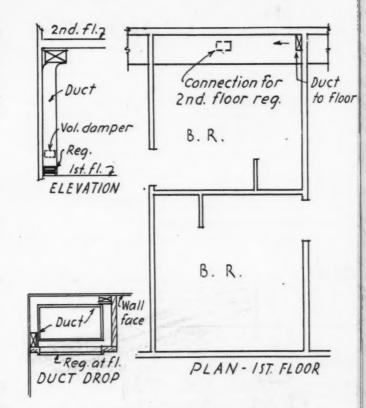


Fig. 4—Excessive floor-ceiling temperature difference (with high registers) may be corrected by putting the register at the floor. Note duct construction. Directional flow louvres can be used to direct air flow toward floor.

11. Poor combustion due to insufficient air.

(a) Provide openings or additional openings in furnace room (this can be accomplished by the blocking of windows). Net area of openings shall be at least twice inside area of stack.

12. Improper air circulation withing dwelling units.

(a) Supply grilles with horizontal deflectors should be adjusted for downward deflection.

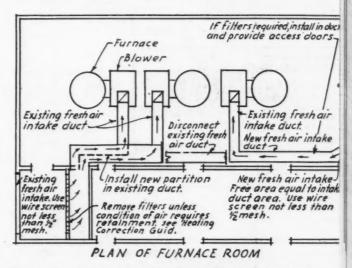


Fig. 6—Inadequate air supply from one outside grille (non-recirculating system) may be corrected by adding a new outside air intake on one furnace or an individual supply for each furnace.

Forced Warm Air (Tenant Operated)

1. Excessive heat loss due to "leaky" construction.

(a) Plug "leaks" by correcting faulty construction such as (1) openings in ceiling at outside walls, (2) openings in exterior walls at floor line, (3) openings around doors and window frames, etc. (This should be done before any of the steps to correct the heating system is attempted.)

2. Crawl space open.

(a) Enclose space. See Illustration No. 1.

3. Improper air circulation.

Excessive temperature differential between floor and ceiling.

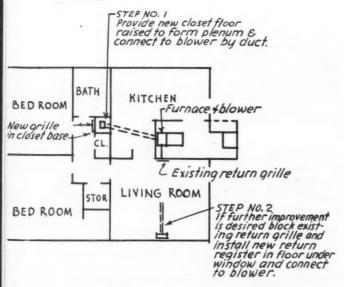


Fig. 8—Single return systems may need a new return in the hall (old return also used) or old return may be closed and a second new return placed near an outside wall and connected to blower.

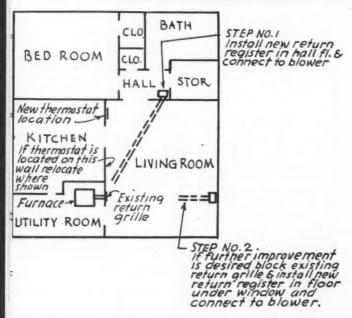


Fig. 9—Corner furnaces with close-coupled return, may need an additional return (closed) from the hall or one new return in the hall plus a new return from an outside corner. The old return is then blocked off.

- (a) Supply grilles with horizontal deflectors should be adjusted for downward deflection.
- (b) Provide volume dampers or adjustable scoops or deflectors in duct work.

4. Uneven heating between rooms (due to single return on inside living room wall).

- (a) Locate additional return outlet in bedroom hall. See Illustrations 8, 9 and 10.
- (b) To further improve circulation, block present return outlet on inside living room wall and locate new outlet in living room at outside wall. See Illustrations Nos. 8 and 9.

5. Frequent periods of overheating and underheating.

(a) In general, regulate system so fan operates over longer periods. Set bonnet fan switch as low as practical without causing relatively cold air.

6. Inadequate storm protection.

(a) Provide storm doors and windows (except for +15 degree design temperature).

(b) Provide ceiling insulation to give "U" factor of 0.08 (this should be done in all heating zones).

7. Insufficient air at supply outlets.

(a) Remove filters; do not replace.

(b) Increase fan speed by adjusting pulley.

8. Smoke pipe of water heater connected to furnace smoke pipe.

(a) Connect smoke pipe from water heater directly to chimney (this applies to all combinations of fuels.

9. Exceptionally poor draft conditions.

(a) Provide an independent flue for each piece of equipment.

10. In addition to the foreging, two story row houses have additional problems as follows:

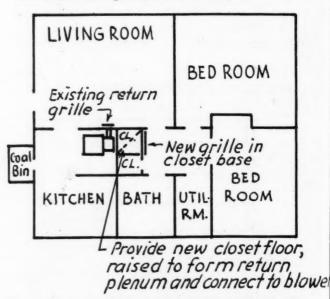


Fig. 10—This common system with one return from living room may get improved circulation by adding a second return from the hall (under a raised closet floor).

Overheating of second floor (due to first floor supply air discharging into stair well).

- (a) Relocate living room supply outlet to prevent direct diversion of air to second floor. Locate supply outlet at floor (first floor).
- (b) Relocate returns on first floor. See Illustrations Nos. 11 and 12.

Hazardous Fire Conditions

(The following hazardous fire conditions were observed by the consultants in the course of their survey. Steps should be taken to correct these conditions.)

1. Relief vent.

(a) Provide an emergency relief duct from each furnace, discharging to the outside (for purpose of preventing overheating of ducts). See illustration No. 7.

2. Fire dampers.

- (a) Provide fire dampers in (1) each supply duct leaving furnace room; (2) where ducts pass through fire walls. Dampers to comply with NBFU Pamphlet No. 90. Accessibility for resetting damper should be convenient.
- (b) Provide indicator to show positon of damper. Indicator should be visible to firemen.

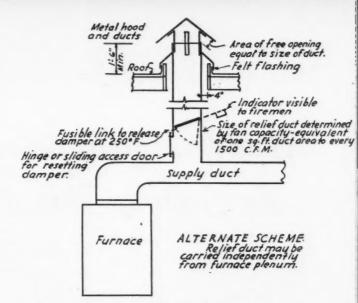
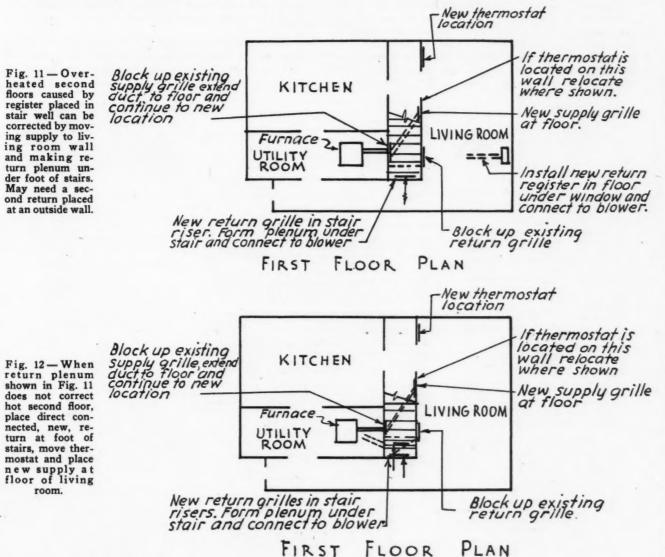


Fig. 7—This scheme to relieve "too hot ducts" the editors think is silly. Why should there be "too hot ducts?" A better solution to this "hazard," we are sure, is to find the cause and remedy it.

3. Furnace room.

(a) Protect combustible open wall studding in furnace room where fireman is likely to drop ashes.

(Continued on page 196)



American Artisan, January, 1944

RESIDENTIAL AIR CONDITIONING SECTION

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Furnace Dealers:

You Can Help Advertise Our Industry By Getting This Publicity Published

N THE facing page is a reproduction of three newspaper releases which the Publicity and Merchandising Committee of the National Warm Air Heating and Air Conditioning Association mailed to a selected list of 1700 daily and weekly newspapers in this country and Canada and below is the accompanying letter of explanation.

The hope of the committee is to get as much of this material published as possible while the subject of fuel

conservation is important to home owners.

Contractor readers of AMERICAN ARTISAN can assist in this effort to publicize our 20 years of research by taking all three releases or one release at a time to some friend on the local newspaper. Explain that this material is based on almost 20 years of research at the University of Illinois and has "no axe to grind" for fuels, types of heating systems, etc., but is authentic data from an accredited university research program.

Perhaps the material has already reached your newspaper friend; if he has filed it away for possible use, ask him to get it out and use one release a week while the heating season is in full swing. If your friend has thrown the material away, show him your copy of this issue or tear out the page for him. Don't suggest writing the association for another copy, for all copies are exhausted.

If your local paper publishes a home builders' page or a real estate page, this type of material should be of interest.

If you advertise in your paper, your request to consider use of this material should be favorably received and you might tie your advertisements to the release by offering service on fuel conservation problems.



National Warm Air Heating and Air Conditioning Association

145 PUBLIC SQUARE (secrety per services solution)

CLEVELAND 14, OHIO

November 15, 1943

TO THE EDITOR

Dear Editor:

Next to news about the war and taxes, the subject of HOW TO HANDLE THE HOME HEATING PLANT, is one of the livest matters which can be laid before the American public today.

Our Association for many years has sponsored a series of Research Investigations on every day heating problems in a typical American home at the University of Illinois with the tests being carried on by noted University professors.

Out of this work have come many interesting developments of particular importance at this time when the public is so fuel saving minded.

By popular request we have summarized a number of these findings and made them into the short stories shown on the facing page. At a glance, you can see how they will fit nicely into your page make up, as a once a week feature.

Papers which have used this material in the past and have acquainted their advertising departments with the move, have found these releases not only a feature for extreme reader interest, but something to help get the heating men to advertise regularly.

This material, the mats, copy and rights for use, are offered for your use.

Please have your clipping department send clippings upon publication to the above address.

Very truly yours,

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION

Nanaging Director

Geo. Boeddener

124

AMERICAN ARTISAN, January, 1944
RESIDENTIAL AIR CONDITIONING SECTION

HEATING FACTS BASED ON AUTHORITATIVE TESTS IN A TYPICAL AMERICAN HOME AT THE UNIVERSITY OF ILLINOIS

Suggestion for Use of Fireplace to Conserve Fuel

In their investigation of home heating subjects during the past nineteen years in the typical American home, the Engineering Experiment Station of the University of Illinois in conjunction with the National Warm Air Heating and Air Conditioning Association have brought to light many facts of timely importance to home owners who wish to cooperate with the war time "save fuel" program being recommended by our federal government.

Tests were conducted with and without the use of the fireplace in the living room. When the room thermostat was located in the dining room the temperatures in all of the rooms, except the living room, were maintained at about 72 degrees F. Hence, the open fire in the living room served merely as an adjunct to the main heating plant. With this method of operation the fuel consumption for the house was slightly greater than when the fireplace was not used. Tests were conducted with and

greater than when the fireplace was not used.

When the room thermostat was located in the living room, the localized heating effect in the room by the open fire served to satisfy the demands of the room thermostat, with the result that the temperatures in the remainder of the house dropped several degrees below 72 degrees F. Under these conditions, a substantial saving in fuel consumption was effected by the fireplace fire. In order to obtain the maximum fuel conservation of the main heating plant with the least disturbance to comfort conditions in the house, the following method of operation is desirable:

(a) Use fireplace fire in living room.

following method of operation is desirable:

(a) Use fireplace fire in living room and turn off heat, manually or automatically, to all other rooms in the house.

(b) Use fireplace in mild weather in fall, early winter, and

spring.
(c) Use fireplace only on relatively

calm days.

(d) Close fireplace damper when fireplace is not in use, or place a tightly fitting cover over the front of the fireplace after the fire has died down.

New Firing Method Saves Coal, Reduces Smoke

Nineteen years of research and tests in the National Warm Air Heating and Air Conditioning Association's Warm Air Research Residence at the University of Illinois has resulted in saving millions of dollars for warm air furnace users in the United States.

A new firing method for burning soft coal has recently been developed and proved at the University of Illinois which makes possible further savings. Coal dealers in the United States and Canada are urging this new "nut and slack" method as a means of saving fuel this winter.

"Any clean nut or egg size coal is satisfactory when this method is used," explains Prof. J. R. Fellows. "Nut coal 2 or 3 inches in diameter is most desirable. With lump coal the large pieces must be broken.

"Slack is coal that is much finer than nut. Screenings, yard forkings, or stoker coal all are satisfactory. Fine coal from the regular pile can be used."

He gives four rules:

Fine coal from the regular pile can be used."

He gives four rules:

1. Do not fire fresh coal on top of hot coals. If hot coals remain over all the grate, probe the thinnest section and if practicable wait until this has burned out before refiring.

2. Move any remaining hot coals away from the area to be filled with fresh coal, and clear the space by probing with a poker to break clinkers and work all fine ash through the grate.

3. If a fiame does not start immediately, use crumpled papers to start a blaze. Failure to establish a fiame may cause an explosion. If the flame goes out when the firing door is closed, leave the door open a quarter-inch until the flame is established. Leave door slots or door damper open enough to avoid "puffing."

4. Avoid overheating. Do not wait until your house is thoroughly

4. Avoid overheating. Do not wait until your house is thoroughly warm before checking the fire. Never allow fire to become excessively hot.

A complete firing chart and in-structions showing disposition of coal in fire pot of furnace will be mailed free. Send post card to the University of Illinois, Engineering Experiment Station, Urbana, Illi-nois, and ask for "Firing Chart."

Four Ways to Save Fuel **Based on Tests**

Four effective methods of reducing residential fuel consumption possible today as proven by test during nineteen years of research in the National Warm Air Heating & Air Conditioning Association's Warm Air Research Residence at the University of Ullipsis are:

Air Research Residence at the University of Illinois, are:

1—Application of tightly fitting storm sash to all windows.

2—Filling all wall spaces with in-

sulation.

3.—Application of 4 inches of insulation between the joists of the top floor celling.

4.—Installation of storm doors.

By installing tightly fitting storm sash and doors and insulation of wall spaces and ceiling, the fuel consumption of the furnace heated Warm Air Research Residence has been reduced approximately 50%.

These methods provide the house with an "overcoat" which keeps cold outside air from leaking into the house and, simultaneously, prevents the inside air which has cost money to heat, from leaking out.

HOW STORM SASH

to heat, from leaking out.

HOW STORM SASH
SAVE FUEL
Tests made in this Warm Air
Heating Research Residence at the
University of Illinois during 19
years show that the 20% reduction
in fuel savings made possible by the
use of storm sash is possible only
when the storm sash are tightly
fitted and are drawn up tight when
closed. If only partial sashing is
possible, storm sash should be placed
on north and west windows.
STORM SASH ALSO INCREASE

STORM SASH ALSO INCREASE
COMFORT
Storm sash do several things to
reduce fuel consumption and increase comfort. First, properly fitted sash provide a "dead air" space between the two panes of glass. This "dead air" is an insulator and raises ween the two panes of glass. This
"dead air" is an insulator and raises
the temperature of the inside glass.
Second, these sash prevent cold air
from leaking in and warm air from
escaping. Third, tests show that
with sash the cold air which ordinarily "rolls" down a window is
warmer than without sash and the
quantity of this cold air is reduced.
The result is two to three degrees
warmer air at the floor near a window. Fourth, sash raise the temperature of the inside glass surfaces so
that a person sitting near a sashed
window does not feel so chilly—the
result of loss of body heat to cold
surfaces. Fifth, sash keep out soot.
Sixth, sash remit the owner to
carry a higher relative humidity indoors (which cuts fuel consumption)
without getting moisture condensation on the glass.

ATTIC INSULATION
Maximum fuel reduction through
application of insulation in the attic application of insulation in the attic floor was investigated exhaustively in the Warm Air Research Residence. The tests show that a layer of asphalt-treated paper should be laid on the lath of the ceiling below and over this paper the insulation should be evenly spread to approximately a depth of four inches. Insulation may be rolls or batts, or loose fill or pellet

much thickness as possible and keep the thickness uniform. Two inches or more are recommended.

WALL INSULATION CALLS FOR EXPERIENCE Insulation of the outside walls in old houses is practicable only through the services of an insulating contractor who has the equipment and experience to "blow" insulation into the spaces. To be advantageous, such wall insulation should fill all spaces, should not settle, must be introduced between all "stops" or obstructions in the wall. Where to "blow" in and how to tell when the space is filled requires more experience than the owner usually possesses.

The Warm Air Research Residence where these tests were made was erected by the National Warm Air Heating & Air Conditioning Association in 1924 and has been occupied by members of the staff of the University of Illinois Engineering Experiment Station continuously since. These tests on fuel savings briefly summarized here have been under way all during these nineteen years and are part of an exhaustive study to determine how to keep American home owners comfortable.

, 1944

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CS109-44, FHA—Bureau of Standards New Furnace Performance Standards

Effective March 10, 1944, all solid fuel burning, forced air furnaces must be constructed in conformance with; must be tested in accordance with; must perform to satisfy — the new "Standard" CS 109-44. The few paragraphs below give data of interest to dealers — the complete "Standard" constitutes many pages of detailed data. The method of testing has not yet been approved by the NWAH&AC Ass'n — presumably each manufacturer must do his own testing. If you want to know what your furnace will be and do after next March, get a copy of the code from Bureau of Standards, Washington, D. C.

PURSUANT to a request dated April 20, 1942, from the Federal Housing Administration, there was developed with the aid of interested agencies and laboratories, including the National Warm Air Heating and Air Conditioning Association and the Anthracite Industries Laboratory, a proposed commercial standard for coal-burning furnaces.

A draft was circulated November 11 and 12, 1942, to leading distributors, testing laboratories, manufacturers, and users for comment. Following adjustment February 22 and 23, 1943, in the light of that comment and after special consideration by the NWAHACA, a revised draft of the proposed commercial standard was circulated on August 16, 1943, to the entire trade for written acceptance.

Those concerned have since accepted and approved the standard as shown herein for promulgation by the U. S. Department of Commerce through the National Bureau of Standards.

The standard is effective for new production from March 10, 1944.

Purpose

1.0 This standard is provided as a basis for guaranteeing the construction and performance of solid-fuel-burning forced-air furnaces, for the guidance of manufacturers, testing laboratories, distributors, installers, contractors and purchasers.

Scope

1.1 This standard covers surface-fired and magazine-feed, solid-fuel-burning warm air furnaces with forced-air circulation in sizes up to 80,000 Btu output, when using chestnut size anthracite as a test fuel, and is composed of the following sections:

	OTTE	posed of the following sections.	
S	ecti	ion	Page
	1.	Purpose, scope, definitions	1
	2.		3
	3.	Construction requirements	4
		Performance requirements under test	
	5.	Test code	6
	6.	Data and report sheet	11
	7.	Informative labeling	16
		Appendix I-Method of interpolating	
		test results	29
		Appendix II-Graphic method of de-	
		termining flue gas loss	30
		Appendix III-Suggested form of log	00
		data sheets	32
			-

Performance Requirements Under Test

4.00 A stock model of the furnace as offered for general sale shall, when tested as described under Section 5, meet the following performance requirements:

4.10 Efficiency.—The average bonnet efficiency from three consecutive test cycles shall be at least 55 per cent for forced-air circulation furnaces.

4.11 Stack temperature.—The flue gas temperature, measured as hereinafter specified, shall not exceed 830°F above laboratory temperature.

4.12 Draft.—The draft used, measured as hereinafter specified, shall not exceed 0.06 inches water gage.

4.13 Attention period.—The period between attentions shall be at least 8 hours for surface-fired and 12 hours for magazine-feed furnaces. Attention shall be considered firing, poking, or shaking grates. Adjustment of dampers at any time, is permissible attention.

4.14 Heat exchanger surface temperature.—The temperature of the metal serving as heat exchanger surface shall not exceed that of the inlet air temperature by more than 930°F as measured by the thermocouples. The average for the entire test as indicated by thermocouple readings taken at the selected spots on the heat exchanger surface shall not exceed 830°F above inlet air temperature.

4.15 Surface temperature.—The surface temperature of the jacket when operating at maximum rating shall not exceed 230°F above laboratory temperature except at points above the firing door or within 6 in. of the sides of the door frame or within 6 in. of the flue pipe.

4.16 Bonnet pressure.—The pressure of delivered air in the bonnet shall be maintained at 0.20 in. water

4.17 Air temperature rise.—With a bonnet pressure of 0.20 in. water gage, the blower shall deliver a flow of such volume that the average air temperature rise shall not exceed 100°F or be less than 70°F.

4.18 Laboratory temperature.—The laboratory temperature shall be taken as that of the inlet air. $(T_2 \text{ figure 1.})$

4.19 Fan operation.—The fan shall be operated continuously during all tests except as otherwise specified.

4.20 Air filters.—Air filters shall not be in place except during air filter temperature tests.



Stok-A-Timer A very dependable stoker control. Easy to adjust for various conditions.



SENSATHERM











Pressure Control

This control has a record for its reliable service and long life. The outside double adjustment is a fa-vorite with the trade.



Immersatherm

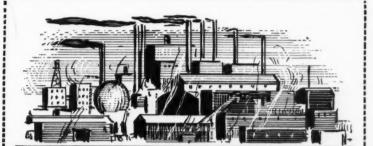
A summer-satherm

A summer-winter domestic hot water supply control. Used with steam, vapor and hot water systems, also on many industrial applications.



Combined Pressure & Low Water Control

Guards against low water and excess pressure in steam boilers.



Mercoid Control production is now largely confined to industrial types for American industry engaged in essential war work.



HOT WATER LIMIT

WARM AIR LIMIT

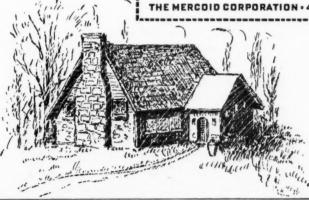
A new small type with outside adjustment. A similar control also avail-able for fan or blower ap-plication.



Visaflame

A light actuated safety con-A light actuated safety con-trol system assuring full protection against flame, ignition or power failure. A great improvement in oil burner control performance. Types available for domestic and industrial applications.

THE MERCOID CORPORATION • 4201 BELMONTAVE. • CHICAGO, ILL.



WHEN IT'S OVER

-and we again get back to the normal way of life, many more homes will have the opportunity of enjoying automatic heat the Mercoid way of perfect room temperature control with oil heat, willed coal stokers, etc., on any type of heating plant





Yes, here it is . . . 1944 . . . the year you were looking forward to, yesterday.

Tremendous, world shaking events are going to happen this

year—events in which you and we are going to play a part. It's going to be a year of immense accomplishment.

This year . . . in 1944 . . . we hope and expect that America and our Allies will break the back of the Axis. Before the end of this year, we hope and expect that this will be a better world, in which America and American ideals will be safe.

Before the end of this year, we also hope and expect that we and others in our industry, still intensely occupied with producing the materials of war, can be released in considerable part from this grim task, in order to resume the happier job of making American homes comfortable and healthful.

Already some of the restrictions are being relaxed. PREMIER is today making cast iron and steel furnaces in limited quantities. Very

And when full scale production can be resumed. PREMIER will be ready with a larger and better line than ever before—a line including virtually every practical type of warm air heating and air conditioning equipment for the home, as well as complete accessories and fittings for every installation. No electronic or infra-red gadgets, but sound, practical, efficient equipment, with many new refinements in appearance to further enhance salability.

PREMIER will also be ready with a new program of dealer cooperation—including a finer, more complete engineering service, and the most effective advertising and selling helps.

Fortunate, indeed, will be the dealer with the exclusive PREMIER franchise in this great new market. For he will be in a position to render the widest service—and thereby earn for himself the most abundant rewards.

PREMIER FURNACE CO.
DOWAGIAC, MICHIGAN

PREMIER

THE year Round LINE

200,000 Replacement Furnaces Is Still The Picture for 1944

Materials are easier — especially cast iron — but shortages of manpower and expectancy of still greater labor stringencies in some areas, make it questionable if the 200,000 furnaces for replacement forecast last October will be exceeded in 1944.

In the October, 1943 issue American Artisan reported from Washington that Office of Civilian Requirements anticipated a production of some 200,000 furnaces for replacement purposes in 1944. The problem which worried OCR most, then, and still does, is how to get these 200,000 furnaces fairly distributed so that no home owner needing a furnace would have to go without one or suffer from delay.

In the November and December issues, AA published a suggested plan, based upon the number of furnaces in use as shown by Bureau of Census figures, whereby if every agency in the industry cooperated 200,000 furnaces would be fairly distributed. Tabulations, by area and states, in the November and December issues showed how many furnaces each county in the country should get—based upon this suggested plan.

Some readers may have mistaken this for an official order—it is not an order—only a suggested plan for voluntary cooperation.

In this issue these tabulations are continued for OCR's area 3—the southern states—and the area having the fewest furnaces in use.

All along, three plans for distribution have been considered. These are:

- 1-Rationing, under government control.
- 2-Some voluntary plan, such as AA's.
- 3—A plan suggested by WPB, whereby each manufacturer lists his jobbing and direct-sales-to-dealer accounts and from past records determines how many furnaces each account received in some "normal" year. This number of furnaces shipped to each account is a "percentage" of each manufacturer's total delivery. Then assuming the manufacturer produces in 1944 a certain number of the 200,000 furnaces to be made for replacement, the manufacturer will ship each account this predetermined percentage of the furnaces he will make in 1944. The jobber, in turn, will follow the ame procedure. This, theoretically, will insure, in 1944, a fair number of furnaces—and an equitable number of furnaces—all through our normal distribution channels.

No hard-and-fast plan has been adopted. Either through a plan like AA's or a plan like number 3, the industry and Washinton is hoping that whatever the number of furnaces to be produced in 1944—we will

get equitable distribution and every hardship case will be taken care of.

Since the original forecast of 200,000 replacement furnaces was made in October, several developments have taken place. As the picture looks in January, we find:

1—Cast iron has become so plentiful that most control has been released and a furnace manufacturer may have as much pig as he wants.

2—Steel, for furnaces, is still in some doubt. Some authorities say we will get more; some say we will get about the same as 1943; some say we will get less.

3—Meanwhile, the manpower picture has not improved. Manpower, right now, looks like the controlling factor which will determine how many furnaces each manufacturer will be able to produce. Many large furnace producers are in critical labor areas (Areas 1 and 2) and their chances of getting more help are pretty slim. Their chances of getting common labor—which is the big need—are worse than the chances of getting skilled labor.

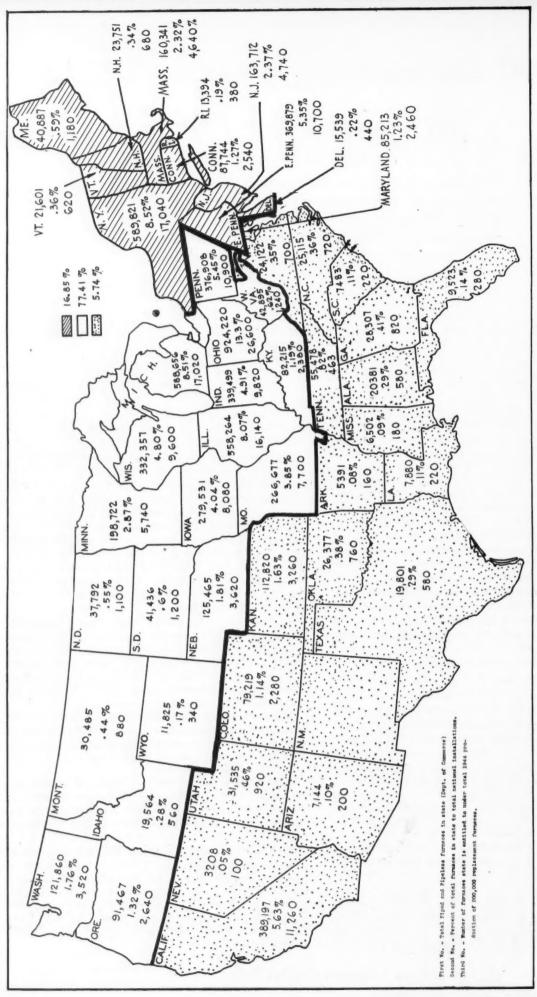
4—Therefore, the survey made among manufacturers last August showing that the industry could produce some 63,000 furnaces of all types in the fourth quarter of 1943, seemingly, still holds good and we may not get, in 1944, any more furnaces than we counted on in October—about 200,000 furnaces for replacement in 1944.

If, as we begin 1944, 200,000 furnaces to 250,000 furnaces for replacement purposes in 1944, remains our expectancy, it becomes more important than ever that this industry make plans to obtain equitable distribution of these furnaces.

200,000 furnaces will not satisfy all the requests for replacement furnaces dealers will receive in 1944. It will be necessary to repair many furnaces so that the 200,000 can be spread to take care of the "hardship" cases.

Such being the case, AMERICAN ARTISAN again urges every dealer to study these county quotas. And from these quotas determine about how many new furnaces each dealer in each county should expect to install. There is every possibility for some dealers to get more than their share—only if every dealer and jobber applies some patriotic self-denial will we spread these replacement furnaces fairly.

Area 3 County Quotas Follow



the number of replacement furnaces each county may expect if production is 200,000 furnaces in 1944. Should production The figures in each state indicate (line 1) the total number of furnaces in use; (line 2) the percentage this number is of the New Mexico. Similar maps for Area I appeared in November and Area 2 in December. State tabulations following show total furnaces in use in the country; (line 3) the number of replacement furnaces the state is entitled to on the basis of 200,000 replacement furnaces produced in 1944 multiplied by this percentage. This map shows the whole country except exceed this, use the tabulated figures plus a percentage determined by the ratio of 200,000 to the actual production.

Furnaces Installed by States and Counties and Replacement Furnaces Available in 1944

(Area 3) (On Basis of 200,000 Production)

CA	I F	~ r	40	II A	
(A	ш	1 1 1	✓ IN	на	

No. I	Total Furnaces Installed	389,	197
No. 2	% of National Total	!	5.63%
No. 3	Allotment of 200,000 Quota	11,	260

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Alameda	57,341	14.73	1,659
Alpine			****
Amador		.03	3
Butte		.35	40
Calaveras		.01	1
Colusa		.02	2
Contra-Costa		1.94	218
Del Norte		.05	6
El Dorado		2.69	303
Fresno		.01	1
Humboldt		.09	10
Imperial		.01	1
Inyo		.03	3
Kern		.75	84
Kings		.27	31
Lake		.02	2
Lassen		.04	5
Los Angeles		37.95	4,273
Madera		.24	27-
Marin		1.38	155
Mariposa		.01	1
Mendocino		.04	5
Merced	1,268	.32	36
Modoc	. 57	.01	1
Mono	36	.01	1
Monterey	. 3,609	.93	105
Napa	. 1,321	.34	38
Nevada	. 181	.05	6
Orange		.66	74
Placer	. 604	.15	17
Plaumas		.02	2
Riverside		.58	65
Sacramento		2.77	312
San Benito		.10	11
San Bernardino		.85	96
San Diego		2.32	261
San Francisco		13.54	1,525
san Joaquin		1.94	219
San Luis Obispo		.14	16
San Mateo		4.29	483
Santa Barbara		.80	90
Santa Clara		4.87	548
Santa Cruz		.60	68
Shata		.05	6
Sierra		10	44
Siskiyou		.10	11
Bolano		1.03	116
Sonoma		.40	45
Stanislaus		.70	79 8
Sutter		.07	8 2
rehama			2
Crinity		0.0	110
Culard		.98	110
ruolumne		.03	3
Ventura		.33	37
Yolo			33
Yuba	. 199	.05	6

Counties	No. 4 Total Furnaces 'Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Archuleta	5	.01	
Baca	m 0	.09	2
Bent	4.00.4	.22	5
Boulder		3.24	74
Chaffee		.10	2
Cheyenne		.11	3
Clear Creek		.04	1
Conejos		.02	
Costilla		.02	
Crowley		.10	2
Custer		.01	
Delta		.34	8
Denver		54.28	1,237
Dolores			
Douglas		.16	4
Eagle		.06	1
Elbert		.21	5
El Paso		6.35	145
Fremont		.56	13
Garfield		.32	. 7
Gilpin		.01	
Grand	4.00	.06	1
Gunnison		.11	3
Hinsdale			
Huerfano		.22	5
Jackson		.01	
Jefferson		3.05	70
Koiwa		.05	1
Kit Carson	201	.29	7
Lake		.07	2
La Plata		.31	7
Larimer		2.99	68
Lasanimas		1.53	35
Lincoln		.31	7
Logan	. 683	.86	20
Mesa	. 1,636	2.07	47
Mineral		.01	* * * *
Moffat		.21	5
Montezuma		.08	2
Montrose	. 300	.38	9
Morgan	. 903	1.14	26
Otero	. 1,135	1.43	33
Ouray	20	.03	1
Park	. 27	.03	1
Phillips	. 277	.35	8
Pitkin	. 11	.01	
Prowers		.66	15
Pueblo		7.23	165
Rio Blaneo		.05	1
Rio Grande		.06	1
Routt	. 117	.15	3
Saguache			
San Juan		.01	
San Miguel		.04	1
Sedgwick		.27	6
Summit		.03	1
Teller		.07	2
Washington	190	92	5

No & Allaiment

COLORADO

No. I	Total Furnaces Installed	. 79,219
No. 2	% of National Total	. 1.14%
No. 3	Allotment of 200,000 Quota	. 2,280

Counties	No. 4 otal Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)	
Adams	. 1,119	1.41	-32	
Alamosa	. 56	.07	2	
Arapahoe	. 2,502	3.16	72	

DISTRICT OF COLUMBIA

Teller Washington

No. I	Total Furnaces Installed	24,950
No. 2	% of National Total	.36%
No. 3	Allotment of 200,000 Quota	720

Counties		No. 4	No. 5	No. 6 Allotment
		Total Furnaces	% of State	of State Quota
		Installed	Total	(No. Furnaces)
D. (C	24,950	1.00	720

-		4		-		-
	K	А	N	1	A	1

No. I	Total Furnaces	Installed	
		Total 1.63%	
No. 3	Allotment of 2	00,000 Quota 3,260	

Count		No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotmen of State Quote (No. Furnaces
		004	.35	11
	n		.17	6
			1.29	42
Barber		. 321	.28	9
			1.32	43
			.56 1.06	18 35
			.83	27
			.21	7
	ıua		.04	1
			.29	10
	е		.19	6
			.09	3 29
			.89 .87	28
		355	.31	10
	e		.11	4
			.74	24
			1.53	50
			.24	8
	n		1.76 .50	57 16
	1		2.61	85
			.29	9
			.07	2
		784	.69	22
	1		.43	14
			43	14
			1.07	35 25
			.78 .98	32
			.13	4
			.09	3
			.03	1
			.13	4
			.04	1
	od		.35	11
			.41	13
			1.41	46
			.08	3
	n		.13	4
			.43	14
			.37	12
			$\frac{.46}{3.61}$	15 118
			.05	2
			.33	11
iowa		205	.18	6
			.52	17
		91	.08	3
	rth	2,071 306	1.84	60
		186	.16	5
		154	.14	5
		2,534	2.25	73
	n	1,776	1.57	51
		851	.75	24
		1,134 194	1.01 .17	33
		644	.57	6 19
		728	.65	21
	гу	1,024	.91	30
orris		445	.40	13
		64	.06	2
		863	.77	25
		574 241	.51 .21	17
		403	.36	7 12
		543	.48	16
		464	.41	13
ttawa .		486	.43	14
wnee		475	.42	14
nillips .	mio	326	.29	9
ratt	mie	513 826	.45	15 24
		179	.16	5
		3,939	3.49	114
		532	.47	15
ce		996	.88	29
ley		2,499	2.22	72
		393	.35	11
		231	.20	7
line		528	.47	15
		4,398 110	3.90	127
		14,381	12.75	3 416
		170	.15	5
awnee		11,959	10.60	346
	*********	162	.14	
		246	.22	· 5

To Counties	No. 4 tal Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Smith	363	32	10
Stafford	426	.38	12
Stanton	34	.03	1
Stevens	44	.04	1
Sumner	825	.73	24
Thomas	320	.28	9
Trego	276	.24	9
Wabaunsee	285	.25	8
Wallace	87	.08	3
Washington	613	.54	18
Wichita	31	.03	1
Wilson	210	.19	6
Woodson	119	.11	4
Wyandotte	16.941	15.02	490

MARYLAND

No. I	Total Furnaces Installed	85,213
No. 2	% of National Total	1.23%
No. 3		2,460

Counties	No. 4 otal Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Allegany	4,713	5.53	136
Anne Arundel	2,437	2.86	70
Baltimore City	50,309	59.04	1,452
Baltimore County	8,412	9.87	243
Calvert	111	.13	3
Caroline	330 -	.39	10
Carroll	1,504	1.76	43
Cecil	1.155	1.36	34
Charles	80	.09	2
Dorchester		.18	4
Frederick	1.684	1.98	49
Garrett	458	.54	13
Harford	1.209	1.42	35
Howard	523	.61	15
Kent	168	.20	5
Montgomery	3,278	3.85	95
Prince Georges		3.28	81
Queen Annes	195	.23	- 6
St. Marys	42	.05	1
Somerset	120	.14	3
Talbot	266	.31	8
Washington	3,743	4.39	108
Wicomico	1,275	1.49	37
Worcester	254	.30	7

UTAH

	Total Furnaces Installed	31,535
No. 2	% of National Total	.46%
No. 3	Allotment of 200,000 Quota	920

Counties	No. 4 otal Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quote (No. Furnaces)
Beaver	40	.13	- 1
Boxelder	499	1.58	15
Cache	1,438	4.56	42
Carbon	438	1.39	13
Daggett	2	.01	****
Davis	655	2.08	19
Duchesne	44	.14	1
Emery	38	.12	1
Garfield	36	.11	1
Grand	17	.05	
Iron	333	1.05	10
Juab	123	.39	. 4
Kane	33	.10	1
Millard	164	.52	5
Morgan	59	.19	2
Plute	16	.05	
Rich	5	.02	
Salt Lake	19.929	63.19	581
San Juan	17	.05	
San Pete	233	.74	7
Sevier	206	.65	6
Summit	113	.36	4
Tooele	284	.90	8 .
Uintah	122	.39	4
Utah	2,175	6.90	63
Wasatch	124	.39	4
Washington	112	.36	3
Wayne	5	.02	
Weber	4,275	13.56	125

	GEORGIA	
No. I	Total Furnaces Installed	28,307
No. 2	% of National Total	.41%
No. 3	Allotment of 200,000 Quota	820

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotm of State Que (No. Furnac
Appling,		.01	
Atkinson			
Baker		.01	
Baldwin		.09	1
Banks			* * * *
Barrow	15	.05	2
Bartow Ben Hill	76	.03	
Berrien			
Bibb		1.94	16
Bleckley		.01	****
Brantley Brooks		.01	
Bryan		.01	
Bulloch	18	.06	1
Burke		.03	****
Butts		.05 .02	1
Calhoun Camden		.02	
Candler			
Carroll	50	.18	1
Catoosa Charlton	74	.26 .05	2
Charlton Chatham		1.28	11
Chattahoochee		1.20	
Chattooga	42	.15	1
Cherokee		.14 2.80	1 23
Clarke		2.80	
Clayton	58	.21	2
Clinch			****
Cobb		1.21	10
Coffee		.02	1
Columbia		****	
Cook	13	.05	1
Coweta	135	.48	4
Crawford Crisp		.04	****
Dade		.03	****
Dawson		****	
Decatur		.11	1
DeKalb		. 18.84	155 4
Dodge Dooley		.02	****
Dougherty	69	.24	2
Douglas	10	.04	
Early Echols		.04	
Effingham		.01	
Elbert	10	.04	* * * *
Emanuel		.03	
Evans Fannin		.01 .17	2
Fayette		.01	
Floyd		2.24	18
Forsyth	2	.01	
Franklin	1	59.49	420
Fulton		52.43 .03	430
Glascock			
Glynn	15	.05	
Gordon	75	.27	2
Grady Greene		.58 .06	5
Gwinnett		.16	2
Habersham		.12	1
Hall	298	1.05	9
Hancock		.04	****
Haralson		.06	1
Harris Hart		.92	- 8
Heard		.02	
Henry	15	.05	
Houston		.03	****
Irwin	9	.03	1
Jackson Jasper	12	.04	
Jeff Davis			****
Jefferson	9	.03	
Jenkins	4	.01	
Johnson		.01	****
Jones Lamar		.03	****
Lamar Lanier		.00	
Laurens	19	.07	. 1
Lee	2	.01	****
Liberty		.01	****
Lincoln Long		.01	

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Lowndes	67	.24	2
Lumpkin		.02	****
McDuffle	10	.04	
McIntosh		.11	1
Macon		.07	1
Madison			
Marion			
Meriwether		.11	1
Miller			
Mitchell		.07	1
Monroe		.01	
Montgomery		.06	1
Murray		.02	
Muscogee		1.63	13
Newton		.16	1
Oconee		.01	
Oglethorpe		.03	
Paulding		.25	2
Peach		.17	2
Pickens		.01	
Pierce		.01	
Pike		.01	****
Polk		.32	3
Pulaski	12	****	
Putnam		.04	* * * *
Rabun		.05	i
Randolph		.05	
Richmond		1.53	13
Rockdale	16	.06	1
Schley		.02	
Screven		.01	
Seminole	1		
Spalding	80	.28	2
Stephens		.08	1
Stewart		.02	****
Sumter		.14	1
Talbot		.01	****
Tattnall		.01	
Taylor		.05	
Telfair		.01	
Terrell	1		****
Thomas		.16	1
Tift		1.24	10
Toombs		.04	
Towns			****
Treutlen		.05	1
Troup	189	.67	6
Turner		****	
Twiggs Union			* * * *
Upson		.86	7
Walker		1.29	11
Walton		.18	1
Ware		.24	2
Warren		.02	
Washington	3	.01	****
Wayne	2	.01	****
Webster		****	****
Wheeler		.71	6
White		.01 .52	4
Whitfield		.02	1
Wilcox	17	.06	1
Wilkinson		.00	
Worth		****	****

OKLAHOMA-

No. I	Total Furnaces Installed	26,377
No. 2	% of National Total	.38%
No. 3	Allotment of 200,000 Quota	760

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Adair	10	.04	
Alfalfa	291	1.10	8
Atoka	4	.02	
Beaver	73	.28	2
Beckham		.39	3
Blaine		.69	5
Bryan		.20	2
Caddo		.61	5
Canadian	610	2.31	18
Carter		.26	2
Cherokee		,11	1
Choctaw		.02	
Cimarron		.11	1
Cleveland		1.89	14
Coal	17	.06	

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Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Comanche	257	.97	7
Cotton		.10	1
Craig		.38	3
Creek		2.12	16
Custer		.29	2
Delaware		.03	- 4
Dewey		.13	1
Ellis		.06	
		6.27	48
Garfield			
Garvin		.14	1
Grady		.96	7
Grant		.28	2
Greer		.09	1
Harmon		.03	
Harper		.21	2
Haskell		.03	
Hughes	32	.12	1
Jackson	43	.16	1
Jefferson	6	.02	
Johnston		.05	
Kay		4.92	38
Kingfisher		1.37	10
Kiowa		.35	3
Latimer		.06	-

Leflore		.14	1
Lincoln		.23	2
Logan		.58	4
Love			
McClain	54	.20	2
McCurtain		.09	1
McIntosh	15	.06	* * * *
Major	124	.47	4
Marshall	7	.03	
Mayes		.10	1
Murray		.08	î
Muskogee		2.38	18
Noble		.70	5
Nowata		.07	O .
		.06	* * * *
Okfuskee			
Oklahoma		12.22	93
Okmulgee		.39	3
Osace		.64	5
Ottawa		1.01	8
Pawnee		.25	2
Payne	374	1.42	11
Pittsburg	119	.45	4
Pontotoe		.31	2
Pottawatomie	260	.99	8
Pushmataha		.11	1
Roger Mills		.04	•
Rogers		.34	3
		.67	5
Seminole		.02	U
Sequoyah			
Stephens		.31	2
rexas		.60	. 5
Fillman		.74	6
Tulsa	10,790	40.91	312
Wagoner		.05	****
Washington		3.06	23
Washita		.18	1
Woods	528	2.00	15

NORTH CAROLINA

No. I	Total Furnaces Installed	25,115
No. 2	% of National Total	.36%
No. 3	Allotment of 200,000 Quota	720

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Alamance	351	1.40	10
Alexander	. 13	.05	
Alleghany	7	.03	
Anson	34	.14	1
Ashe		.09	1
Avery	. 23	.09	1
Beaufort	104	.41	3
Bertie	. 11	.04	
Bladen	- m	.03	
Brunswick	. 20	.08	1
Buncombe	. 2,793	11.12	80
Burke		1.15	8
Cabarrus	268	1.07	8
Caldwell		.61	4
Camden	. 4	.02	
Carteret	. 7	.03	
Caswell	. 9	.04	
Catawba	308	1.23	9
Chatham		.35	3
Cherokee	0.0	.11	1
Chowan		.03	

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Clay	1		
Cleveland	164	.65	5
Columbus		.36	3
Craven		.57	4
Cumberland		1.59	12
Currituck		.01	
Davidson		.85	6
Davie		.15	1
Duplin		.06	
Durham	861	3.43	25
Edgecombe		.24	2
Forsyth		12.53	90
Franklin		.09	1
Gaston		2.60	19
Graham		.02	
Granville		.14	1
Greene		.04	
Gullford		8.80	63
Halifax	62	.25	2
Harnett		.42	3
Haywood		.82	6
Henderson		1.25	9
Hertford		.08	1
Hyde		.01	
Iredell		1.11	8
Jackson		.08	1
Johnston		.19	1
Jones		.01	
Lee		.45	3
Lenoir		.42	3
Lincoln		.18	1 -
McDowell		.18	1
Madison		.14	1
Martin		.07	î
Mechlenburg		21.84	157
Mitchell		.10	1
Montgomery	13	.05	
Moore		1.20	9
Nash		.34	3
New Hanover		1.69	12 1
Northampton Onslow		.06	
Orange		1.25	9
Pamlico	_	.02	
Pasquotank		.14	1
Pender	9	.04	
Perquimans			****
Person		.08	1
Pitt		.41	3 5
Polk		.74 1.03	7
Richmond		.70	5
Robeson		.22	2
Rockingham	112	.45	3
Rowan	. 472	1.88	14
Rutherford		.18	1
Sampson		1.15	8
Scotland Stanly		.03	2
Stokes		.06	
Surry		1.04	8
Swain		.02	
Transylvania		.12	1
Tyrrell	3	.01	
Union		.26	2
Vance		.44	3
Wake	1,609	6.41	46
Warren Washington	. 48	.19	1
Watauga	. 74	.30	2 -
Watauga Wayne	106	.42	3
Wilkes		.29	2
Wilson	. 65	.26	2
Yadkin	. 21	.08	1
Yancey	. 10	.04	****

VIRGINIA

No. I	Total Furnaces Installed	24,122
No. 2	% of National Total	.35%
No. 3	Allotment of 200,000 Quota	700

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Accomack	108	`.45	3
Albemarle	126	.52	4
Allegheny	193	.80	6
Amelia		.09	1
Amherst	39	.16	1

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotmen of State Quot (No. Furnaces
Appomattox		.02	70
Arlington		11.14 2.47	78 17
Augusta Bath		.05	
Bedford		.62	. 4
Bland		.03	****
Botetourt		.29	2
Brunswick		.11	1
Buchanan	15	.06	
Buckingham		.06	
Campbell		.27	1
Caroline		.11	i
Charles City		.03	
Charles City		.09	1
Charlotte Chesterfield		1.31	9
Clarke		.57	4
Craig			
Culpeper		.44	3
Cumberland		.02	****
Dickenson		.14	1
Dinwiddie		.08	1 9
Elizabeth City		1.26 .15	1
Essex		4.30	30
Fairfax Fauquier		.50	4
Floyd		.05	
Fluvanna		.09	1
Franklin		.32	2
Frederick		1.06	7
Giles	143	.59	4
Gloucester		.24	2
Goochland		.07	1
Grayson		.23	2
Greene		.02 .17	1
Greensville Halifax		.25	2
Hanover		.21	ī
Henrico		2.69	19
Henry		.34	2
Highland		.04	
sle of Wight	22	.09	1
James City	23	.09	1
King Queen		.01	****
King George		.16	1
King William		.16	1
Lanckster		.27	2
Loudoun		1.33	9
Louisa		.09	1
Lunenburg		.30	2
Madison		.06	1
Mathew		.06	1
Mechlenburg		.31	2
Middlesex		.17	1
Montgomery		.77	5
Nansemond	16	.07	1
Nelson		.05	
Newkent Norfolk		.61	4
Northampton		.42	3
Northumberland		.15	1
Nottowky		.34	. 2
Orange	112	.46	3
Page		.89	- 6
Patrick		.12	1
Pittsylvania		.85	6
Powhatan Prince Edward		.05 .17	1
Prince Edward Prince George		.08	1
Prince George		1.21	8
Prince William		.29	2
Pulaski		1.00	7
Rappahannock	44	.18	1
Richmond	8	.03	
Roanoke		4.39	31
Rockbridge	131	.54	4
Rockingham		1.20	8 2
Russell		.22	2
Shenandoah		1.09	8
Smith		.45	3
Southampton		.28	2
Spotsylvania		.11	1
Stafford	71	.29	2
Surry	14	.06	
Sussex	7	.03	
razewell		.82	6
Warren		1.25	9
Warwick		.33	2
Washington		. 1.17	8
		.05 1.42	10
		1.24	10
Wise		36	3
Westmoreland Wise Wythe York	86	.36 .26	3 2

VIRGINIA (Continued)

	TEXAS	
No. I	Total Furnaces Installed	19,801
No. 2	% of National Total	.29%
	Allotment of 200,000 Quota	580

_		No. 4 Ital Furnaces	No. 5 % of State	No. 6 Allotment of State Quota
Counti	es	Installed	Total	(No. Furnaces)
Anderson	1	48	.24	1
Angelina		22	.11	1
	***********	****		****
Arcaer	ng	5 17	.03 .	1
Atascosa		5	.03	****
		36	.18	1
		5	.03	****
Bastrop		24	.12	1
		6	.01	****
		79	.40	2
Bexar .		540	2.73	16
	*******	2	.01	****
		30	.15	1
Bowle .		9	.04	
Brazoria		48	.02	i
Brazos Brewster		1	.01	
Briscoe	*********	2	.01	
	• • • • • • • • • • • • • • • • •	13	.06	****
		2	.01	****
Burnet		5	.03	****
		15 1	.07	1
Callahan		4	.02	****
		28	.14	1
		72	.36	2
		7	.03	****
	*	10	.05	****
Cherokee	'S	14	.01	1
Childress	3	10	.05	
		15 1	.07	1
		3	.01	**** .
		7	.03	
		96 25	.48	3
	vorth	26	.13	1
Comal .		105	.53	3
	ie	12	.06	* * * *
	• • • • • • • • • • • • • • •	35	.18	i
Coryell		6	.03	****
		5	.03	****
		35	.18	1
Crosby		14	.07	1
	n	139	.01 .70	4
		2,023	10.22	59
	************	21	.10	1
	nith	63 64	.32	2
Denton		15	.08	1
	*******	8 17	.04	· "i
		4	.02	
		. 6	.03	****
		63	.01 .32	2
		18	.09	í
	********	****		
	************	48 2,963	.24 14.96	87
		3	.01	****
Falls		10	.05	****
		13 21	.06	1
		133	.67	4
		. 8	.04	****
	nd	7 17	.03	· · · i
Franklin		1	.01	
Freeston	e	3	.01	****
		1 2	.01	****
Galvesto	n	243	1.23	7
		1 16	.01	····i
	k	16	.08	1
Goliad .		4	.02	****
Gonzales		14	1.70	1 10
		336 92	1.70 .46	3
		47	.24	1

TEVAC	(Continued)
I E A A S	I Continued

TEXAS (Continued)				
Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)	
Grimes	6	.03		
Guadalupe	21	.11	1	
Hale		.39	2	
Hamilton		.02		
Hansford		.12	1	
Hardeman		.05		
Harris		16.41	95	
Harrison	29	.15	1	
Hartley		.12	1	
Haskell		.09	1	
Hemphill		.23	· · · i	
Henderson	8	.04		
Hidalgo		.17	1	
Hill		.04	i	
Hood				
Hopkins		.01	****	
Howard		.50 .05	3	
Howard Hudspeth		.01	****	
Hunt		.12	1	
Hutchison		.44	3	
Irion		.01		
Jackson		.03	* * * * *	
Jasper	31	.15	1	
Jeff Davis	1	.01	0.0	
Jefferson Jim Hogg		3.93 $.01$	23	
Jim Wells		.01	****	
Johnson		.11	1	
Jones		.03		
Karnes Kaufman		.03		
Kendall		.04	• • • •	
Kenedy				
Kent		.01		
Kerr		.06	****	
King				
Kinney		.01	****	
Kleberg Knox		.33	2	
Lamar		.56	3	
Lamb	18	.09	1	
Lampasas		.10	1	
La Salle LaVaga		.01	····i	
Lee		.03		
Leon		.24	1	
Liberty		.05 $.06$		
Limestone Lipscomb		.27	2	
Live Oak				
Llano		.03		
Loving Lubbock		2.57	15	
Lyon		.04		
McCulloch		.06	****	
McLennan McMullen		.98	6	
Madison		.03	****	
Marion	3	.01		
Martin		.01		
Mason		.02		
Maverick	2	.02		
Medina		.03		
Menard		.01	3	
Midland Milam		.11	1	
Mills		.01		
Mitchell		.01		
Montague		.08	1	
Montgomery Moore		.22	1	
Morris	1	.01		
Motley		.04		
Nacogdoches Navarro		.08	1	
Newton		.01		
Nolan	29	.15	1	
Nueces		.21	1	
OchiltreeOldham		.20	1	
Oranges	330	1.67	10	
Palo Pinto	2	.01		
Panola			9 0 9 0	
		.04		
Parker			1	
Parker Parmer	16	.08	1 5	
Parker Parmer Pecas Polk Potter	16 157 3	.08		

Counties	otal Furnaces Installed	% of State Total	of State Quota (No. Furnaces)	
Presidio	. 5	.03		
Rains	. 6	.03		
Randall		.90	5	
Reagan		.01	****	
Real		**** 0	****	
Red River		1.06	6	
Reeves		.09	1	
Refugio		.02		
Robertson		.09	1	
Rockwall				
Runnels		.08	1	
Rusk	33	.17	1	
Sabine	19	.09	1	
San Augustine	4	.02		
San Jacinto	. 3	.01		
San Patricio	. 37	.19	1	
San Sabo		.03		
Schleicher	. 2	.01		
Scurry	5	.03	****	
Shackelford	10 13	.05	****	
Sherman		.09	· · · i	
Smith		.33	2	
Somervell		.01	-	
Starr				
Stephens		.01		
Sterling		.05	****	
Stonewall	1	.01		
Sutton		.08	1 -	
Swisher	25	.13	1	
Tarrant		6.42	37	
Taylor		.21	1	
Terrell		.03	* * * *	
Terry	4 10	.02		
Titus		.02		
Tom Green	163	.82	5	
Travis		3.56	21	
Trinity		• .02		
Tyler		.01		
Upshur	12	.06		
Upton		.01		
Uvalde		.01		
Valverde		.04		
Van Zandt		.04		
Victoria		.08	1	
Walker		.18	1	
Waller	-	.03		
Ward Washington		.13	1	
Webb		.03	1	
Wharton		.11	1	
Wheeler		.16	1	
Wichita		1.79	10	
Wilbarger		.22	1	
Willacy	. 4	.02		
Williamson		.20	1	
Wilson		.03		
Winkler		.01		
Wise		.13	1	
Wood		.05		
Young		.01	1	
YoungZa Pata			1	
Za Pata Zavala		.01		
	-			

TENNESSEE

No. I	Total Furnaces Installed	56,478
No. 2	% of National Total	.82°/
No. 3	Allotment of 200,000 Quota	463

Counties	No. 4 Total Furnac Installed		No. 5 of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Anderson	95	-	.17	1
Bedford	264		.47	2
Benton	24		.04	
Bledsoe	36		.06	
Blount	0.04		1.47	7
Bradley	322		.57	3
Campbell			.22	1
Cannon			.03	
Carroll	4.40		.26	1
Carter	555		.98	5
Cheatham			.03	
Chester			.08	
Claiborne			.07	
Clay			.01	
Cocke			.13	1
Coffee	~ .	*	.10	1
(0	antimued	on maa	204)	

(Continued on page 204)

—for essential replacements on priority of AA-5 or better (Priority extension required for shipment of all furnaces and furnace repairs except repair items costing less than \$5.00).

Waterbury manufacture, in compliance with WPB Order L 22, is now limited to sizes 720, 722, 724 and 727 Gastite furnaces and sizes 830, 833 and 836 Seamless furnaces.

Following is our anticipated schedule of shipments on a limited quantity of orders (as of Jan. 3, 1944, subject to change without notice).

- -single gravity furnace for essential replacement where old furnace is beyond repair and unusable-2 to 7 days.
- 2.—same—except no immediate suffering involved—7 to 10 days.
- 3.—single forced warm air heating units requiring blowers—3 to 4 weeks.
- ▲ -2,300 series or 9,300 series air conditioners less burners—immediate shipment. (For burners, permission must be received from WPB on form WPB-2727).
- -orders for carloads or for stock can be accepted for shipment during the early part of the second quarter of 1944.

(War demands and WPB orders may change above schedule).

WATERBURY QUALITY and PERFORMANCE

are being maintained at the high standards for which Waterbury construction has long been famous.

WATERBURY still stands for "SEAMLESS" and for "GASTITE" furnace construction. Waterbury furnaces are still built to keep furnace dirt out of the air stream,—to conserve fuel, to save money and to protect the health of the people who use them.

The Waterbury organization is working for VICTORY

WATERBURY engineering skill and WATERBURY productive capacity are devoted, to a large extent, to the production of war materials.

Yet we are still able to take care of the essential needs of our trade and expect to be able to materially increase our furnace production as VICTORY draws nearer.

Then, as always, we aim to keep WATERBURY at the head of the procession, in design, in engineering and in performance.

> Write for new price list. Let us help you keep up to date in the requirements of the day.



SEAMLESS COAL FURNACE



GASTITE COAL FURNACE



SEAMLESS OIL FURNACE



COMFORTROL AIR CONDITIONER

1944 TION

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PROUDLY, PAYNE FLIES THE FLAG OF "EXCELLENCE"

awarded to the men and women of this 28-year-old Company for "High Achievement in Producing Materials of War."



it also stands for Employe-Enterprise Energy and Exertion

EVEN MORE SIGNIFICANT than the bright, new "E" pennant we are now privileged to display with Old Glory over our plant, is the "E" emblem that every man and woman of our organization has earned the right to wear.

For without our employes' enterprise, energy and exertion, we could not have maintained the standards of quality and production that won this coveted recogni-

tion from the War and Navy Department!

For nearly two years, all of our expanded facilities, our equipment and experience have been devoted to one end: Victory. But when our war job is completed, we shall turn again to the manufacture of PAYNE Furnaces...new, even finer, more efficient models . . . for the peaceful homes of a still-free America, Coast to Coast.

PAYNEHEAT

NEARLY 30 YEARS OF LEADERSHIP

Payne FURNACE & SUPPLY CO., INC. . BEVERLY HILLS, CALIFORNIA

Help Save Fuel — Sell Barometric Dampers

On December 4, WPB provided a special allocation of controlled materials (at the request of OCR) for the manufacture of 400,000 barometric dampers for residential central heating plants, 200,000 barometric dampers for space heaters, 15,000 barometric dampers for industrial heating plants. Manufacturers are directed to sell these draft regulators without any priority rating—contractors may install these regulators without any priority rating.

THE function of a chimney is to dispose of the products of combustion—whether gas, oil or coal is the fuel—by creating a draft inside the heating unit. But if this draft created by the chimney is too strong some of the heat which should go to warming the house is carried out of the chimney and is wasted. If the chimney draft is known to be too strong, the turn damper in the smoke pipe is adjusted to reduce the area of smoke passage and thereby reduce air volume passing through the smoke pipe. On coal furnaces the check damper is also synchronized with the ash pit door draft damper and when the draft door is closed the check is opened so that basement air passes up the chimney and air volume from the combustion chamber is reduced.

But these methods of reducing draft have one common failing—the dampers are set according to some one condition and fluctuations in wind and temperature which increase or decrease the chimney draft are not compensated for.

The barometric damper adjusts itself to variations of wind and temperature to maintain a pre-selected draft over the fire. The barometric damper is, then, a fuel saver.

Contractors wanting to assist in saving fuel, reducing customers' heating costs and desiring something to sell now have by this December 4 WPB order a piece of apparatus which meets all three requisites. The following report describes the things you can do with a barometric damper on the three types of fuel using systems most in need of automatic draft control. These three systems are (1) hand fired coal; (2) stoker fired coal; (3) oil burner installations.

Hand Fired Coal

From the University of Illinois Research Residence comes the following recommendations for draft control of hand fired coal plants:

"Practical experience has proven that for the average fuel bed under average conditions it requires a difference of pressure or draft between the ash-pit and combustion chamber of approximately 0.01 in. of water to burn 1 lb. of coal per sq. ft. of grate surface per hr. Most furnace ratings are based on a combustion rate



"Field" barometric control in place on an oil burning furnace having no "check" or turn damper as recommended.

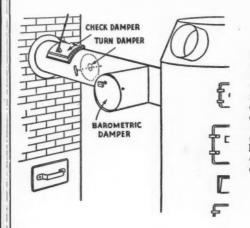
of about 7 lb. of coal per sq. ft. of grate surface per hr. Therefore, a pressure difference of about 0.07 in. of water is required between ash-pit and combustion chamber. In order to obtain the necessary 0.07 in. of water draft between ash-pit and combustion chamber, the chimney must be able to produce considerably more than this at the smoke thimble. While it is customary practice to base the design of a plant on a combustion rate of 7 lb. per sq. ft. of grate per hr. in severe weather, it is desirable to have reserve capacity in excess of this in order to take care of warming-up periods.

"Taking all things into consideration, experience has proved that a house chimney, in order to be entirely satisfactory, should be able to produce a draft of about 0.16 in. of water at the smoke thimble with a good fire in the furnace, and with the check damper closed and the draft damper in the ash-pit door open.

TABLE 70. Draft Loss Between Furnace and Ash-Pit (From Babcock and Wilcox Co.)

Values are based on a combustion rate of 7.5 lb. of coal per sq. ft. of grate per hr.

	Draft Loss,
Grade of Coal	In. Water
Bituminous (Ill., Ind., and Kan.)	0.06
Bituminous (Ala., Ky., Pa., Tenn.)	0.07
Semi-Bituminous (Md., Pa., Va., W. Va.)	0.075
Anthracite (Pea)	0.11
Anthracite (No. 1 Buckwheat)	0.155
Anthracite (No. 3 Buckwheat)	0.265



On old coal fired systems, be sure barometric control is between furnace and any check or turn damper—or take these old dampers out. The barometric damper will exercise complete control of the draft.

Possibly the draft gage reading at the smoke thimble may be as low as 0.12 in. of water before condemning a chimney, but this lower figure is somewhat open to question.

"Any check of the available draft in a given chimney should, therefore, take into account the type of fuel to be burned. A hand-fired coal furnace that utilizes a very small sized coal will, for example, require a much better chimney than a furnace that is to be fired with gas or oil. The values shown in Table 70 were obtained from curves plotted in a catalogue published by the Babcock and Wilcox Co. and show typical draft relationships for various coals.

"The use of automatic draft dampers for hand-fired, coal installations is somewhat limited since in many cases the draft is insufficient rather than excessive. However, in those installations where an excessive draft condition is encountered, an automatic draft regulator may be used to advantage."

Stoker Fired Coal

The use of a barometric damper on a stoker fired system is much more necessary than with hand fired coal (as explained above) because the stoker creates its own draft and it is desirable for the chimney draft to be as low as possible when the stoker is not running in order to keep the heat in the furnace.

Some excellent data on barometric dampers is contained in the booklet "Effect of Stack Damper Setting or Furnace Draft on Stoker Performance" from "Stoker Coal Research Program" of The Koppers Coal Co. Some data on barometric dampers, briefed down, follows:

"With a stoker, air for burning the coal is supplied by a fan so that when the stoker is running the chimney has only to take away the hot gases. It does not have to draw air through the fuel bed. The chimney should, of course, create a slight suction in the furnace so that there will be no escape of gases into the basement even when the firebox door is opened, and should provide some draft to keep the fire burning when the stoker is 'off.'

Normal Draft

"Usually the chimney can create draft in excess of requirements, and the only problem involved is to reduce it to the proper amount by means of dampers.

"The 'turn' damper in the smoke pipe cuts down the draft by partially closing off the opening.

"The 'check' damper partially satisfies the pull of the chimney by admitting air directly into the smoke pipe without its passing through the furnace. This reduces the draft through the furnace without cutting down the size of the opening from the furnace to the chimney. The amount of air drawn through the furnace is progressively reduced as the check damper is opened admitting more and more air directly from the basement. The check damper also reduces the pull of the chimney by cooling since the basement air is cooler than the stack gases.

Barometric Damper

"The most common type of automatic draft control or barometric damper is essentially a floating check damper that is balanced by a weight against the suction in the stack, so that its position changes automatically to maintain a uniform suction or draft-gage reading in the furnace. Thus, when the stoker starts and there is a large volume of gases to be drawn from the furnace, the barometric damper automatically closes to some extent reducing the amount of air from the basement and thus leaving more of the chimney capacity for the hot gases. When the stoker shuts off the damper automatically opens again to draw more air from the basement to compensate for the smaller volume of gases from the fire. This type of damper thus tends to maintain about the same suction in the furnace whether the stoker is on or off.

"There is also on the market a draft control that automatically changes the size of the opening through the smoke pipe, controlling the draft without admitting air from the basement. This device gives results similar to the ordinary barometric damper.

"Every stoker installation should have an automatic draft control in the stack.

Investigation of Damper Settings

"To determine just what the setting of dampers may mean to the stoker owner the Koppers Stoker Coal Research Laboratory has conducted a series of tests.

"A small domestic stoker installed in a steam boiler such as is used to heat a one-family house was run for $5\frac{1}{2}$ days with the stack dampers set to give a low draft. The dampers were then changed to give a medium draft and the stoker was run for $5\frac{1}{2}$ days exactly at it had been run with the low-draft setting. The dampers were then set to give a high draft and the same procedure followed. An automatic draft control in the stack was used to regulate the draft.

"The only difference in each week's run was the stack-damper setting. Measured in the firebox by a

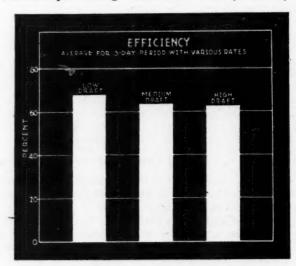


CHART 1—The highest efficiency was obtained with the lowest furnace draft.

suction water gage, the Low-Draft setting gave .02 inches of water, the Medium-Draft .07 inches, and the High-Draft .12 inches with the stoker running.

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Results

"Efficiency was determined as the per cent of the total heat in the coal absorbed by the boiler and delivered in the steam at the boiler outlet.

"Low draft gave the highest efficiency. There was more heat delivered by the boiler for the same amount of coal burned when the draft was low. Chart 1 shows the efficiencies for the week to Friday P.M. This includes overnight Hold-Fires but not the 65-hour Hold-Fire over the week-end.

"Table II below gives efficiencies for both this three-day period and the complete $5\frac{1}{2}$ days.

TABLE II

	Low Draft	Medium Draft	_
Efficiency for 3-day period to Friday P.M Efficiency for entire 5½ days	67.4%	64.3%	63.3%
including week-end Hold- Fire	61.2%	56.9%	55.4%

"Efficiency may be defined in various ways. In the laboratory it is customary to measure the efficiency of the stoker and boiler as in these tests. This efficiency figure allows no credit for useful heat from the furnace itself that warms the basement and heat from the chimney which also helps heat the house. Heat delivered to the house in these ways may amount to 20% or more of the total heat in the coal. The efficiency of the stoker and boiler is useful for comparing results under different conditions such as this series of tests in which the draft was changed.

Control of Heat

"With ON and OFF operation, the Low Draft setting of the stack damper gave more heat when wanted, namely, during the ON period or when there is a demand from the thermostat.

"The High Draft setting gave less heat during the ON period, but more heat during the OFF period. With the High Draft excessive air was drawn through the fire when the stoker was off. This not only burned

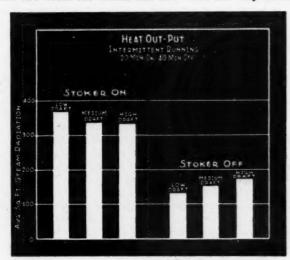


CHART 2—The lowest draft gave the best control of Heat Output. With low draft there was more heat delivered when wanted (STOKER ON) and less heat during idle periods (STOKER OFF).

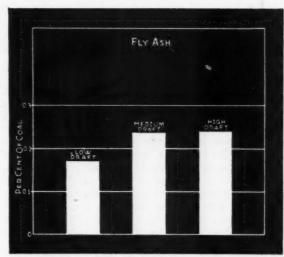


CHART 3-Fly ash accumulation was less with low draft.

down the fuel bed but produced heat when it was not wanted (after the thermostat had been satisfied). This might tend to give over-heating. Chart 2 illustrates this point.

Clinker

"The Low Draft was best for clinker formation. There was more of the ash in the form of clinkers and therefore less loose ash in the fire box with this setting of the stack damper.

"The better clinker formation with Low Draft appears to be due chiefly to the higher temperatures and the deeper fuel bed obtained with Low Draft.

Fly Ash

"There was the least fly ash in the boiler tubes with Low Draft. With the High Draft there was about 40 per cent more. Low Draft therefore means less frequent cleaning of the boiler. The relative amounts of fly ash are shown graphically in Chart 3."

Oil Fired System

As with a stoker, an oil burner of the pressure type creates its own draft and, in most respects, the benefits of a barometric damper with a stoker are also found with the oil burner. The benefits are summarized in the University of Illinois Engineering Experiment Station Bulletin 318 "Investigation of Oil Fired Forced Air Furnace Systems in the research Residence" as follows:

Results of Tests

"Function of Draft Regulating Damper.-In the case of an oil-fired furnace, unlike that of a hand-fired coal-burning furnace, the combustion rate is not dependent on the draft maintained over the fuel bed, and the draft required is only that necessary to carry the products of combustion away from the furnace. For residential installations it is common practice to allow a maximum draft of from 0.02 in. to 0.04 in. of water in the combustion chamber of an oil burner of the type which was installed in the Research Residence. In this connection the following quotation from the work of L. E. Seeley is significant: 'generally it appears that an increase in furnace or fire-pot draft increases the excess air, the flue temperature, the draft loss through the boiler, and decreases its efficiency.' Furthermore, any draft in excess of 0.02 in.

of water tends to draw air through the furnace during off periods of the burner, thus cooling the heating surfaces and resulting in a loss of heat up the chimney.

"The use of the common types of check dampers and cross dampers in the smokepipe alone is not entirely satisfactory, since they do not operate to maintain a constant draft in the smokepipe with the variable conditions resulting from fluctuations in the wind and temperature of the flue gases. In the Research Residence plant an automatic draft-regulating damper of the balanced louver type, 10 in. in diameter, was installed in the clean-out door of the chimney below the connection of the smokepipe from the furnace. This damper was installed so that air either from the basement or from outdoors entered the chimney without passing through the furnace, and it was adjusted so that a draft not exceeding 0.02 in. of water was maintained in the combustion chamber of the furnace during the operation of the burner.

"Operation With Air Supplied From Basement .--Judging from the velocity of the air entering the short section of the 10-in. pipe immediately ahead of the

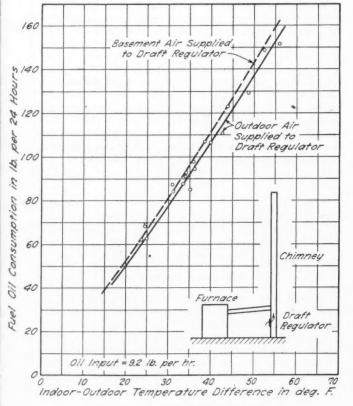


FIG. 17. PERFORMANCE OF DRAFT REGULATOR

draft regulator, it was apparent that a considerable volume of air was drawn from the basement into the chimney through the action of the draft regulator. The volume of heated air leaving the basement and resulting in a loss of heat up the chimney varied considerably from minute to minute depending upon the magnitude and direction of the wind, the outdoor temperature, and the relative lengths of the on periods and off periods of the burner. The ventilating action of the draft regulator was similar to that of an ordinary ventilating stack 35 ft. in height, with 12 in. by 12 in. inside dimensions, and having a bottom inlet 10 in. in diameter.

"An anemometer traverse made at the inlet opening, on a day on which the outdoor temperature was

approximately 45 deg. F., and the oil rate was 7.5 lb. per hr., indicated that the average air velocity through the inlet was approximately 450 ft. per min, when the burner was in operation, and approximately 310 ft. per min. shortly after the burner ceased operation. With a barometric pressure of 29.70 in. of mercury and an inlet air temperature from the basement of 70.5 deg. F., these velocities indicated air weights of approximately 1000 lb. per hr. when the burner was on and 675 lb. per hr. shortly after the burner was stopped. Calculations based on the assumption that the air was heated from 45 deg. F. to 70.5 deg. F. and that the burner operation was 9.2 hrs. during a 24-hour period, gave an estimated heat loss of approximately 117,700 B.t.u. for the 24-hour period. On this day the total oil consumption was 69.14 lb., equivalent to 1,348,000 B.t.u. liberated in the furnace. The calculated percentage of heat loss due to the air passing up the chimney was therefore found to be approximately 8.7 per cent of the total heat liberated in the furnace for the day. These estimates, while admittedly based on assumption, were of such magnitude as to indicate the necessity for further investigation.

"Operation With Air Supplied From Outdoors .-A series of tests at a 9.2 lb. per hr. oil rate was run over a wide range of outdoor weather conditions with the automatic draft regulator arranged to take the air supply from outdoors. The 10-in. inlet duct to the draft regulator was connected, by means of a housing, to an adjacent enclosed space which was open to the outdoors. Accordingly, no air was drawn from the basement, and the temperature of the air supply to the damper was substantially the same as that of the

outdoor air.

"The weight of fuel oil required to maintain the temperature of the house at 72 deg. F., for a 24-hour period, with the air supplied from both the basement and outdoors, was plotted against the difference in temperature between the indoors and outdoors. As shown in Fig. 17, the fuel consumption was approximately 5 per cent less when the plant was operated with the air supply to the draft regulator taken from the outdoors than it was when operated with the air supply taken from the basement.

"The difference between the actual saving of 5 per cent and the calculated saving of about 10 per cent can be accounted for by the fact that in the calculations all of the warm air going up the chimney was regarded as being replaced by cold air in excess of the normal infiltration into the house; whereas, it is probable that actually a portion of the basement air that was wasted up the chimney was replaced by air that entered the house in the form of normal infiltration. In the case of the Research Residence, in which very little outdoor air leaked directly into the basement, the heated air that was wasted up the chimney from the basement was replaced primarily by warm air from the first story rooms. In the case of installations in which the outdoor air can leak freely into the basement, the ventilation induced by the draft regulator would tend to cool the basement and not necessarily to increase the air movement from the first story rooms to the basement. In the latter case, if the draft regulator was arranged to take the air supply from outdoors, the temperature of the basement would be maintained at a higher value and the heat transmission through the floor of the first story into the basement would be decreased.

The chimney in the Research Residence was of good, substantial construction, and was lined on the inside (Continued on page 218)

SHEET METAL

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DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



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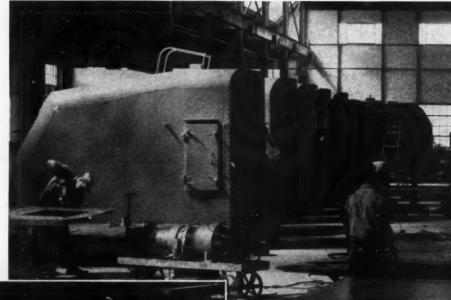
CHICAGO STEEL SERVICE COMPANY

ASHLAND AVE. AT 39th ST.



TELEPHONE LAFAYETTE 7210

Right—Photograph 1— End of Brandt produc-tion line showing gun shields completed, and ready for loading. Skids on which final assembly was made accompany shields onto car.





Left-- Photograph 2-Subassemblies have been made and welded, and sub-assemblies are here put together for either bolting or welding. Welds are ground down, frames attached, hardware is installed and final touching up done ready for painting. By making up sub-assemblies in suitable fixtures, no elaborate fixtures are needed here.

Gun Shields-

Fabricated of Armor Plate

WAR contract requiring "know-how" of the highest order, plus equipment and facilities beyond the ordinary, has been in process for many months in the plant of Charles T. Brandt, Inc., Baltimore, where gun mount shields for the Navy are fabricated from armor plate.

Brandt is proud of the fact that their plant received of these shields and an award of the third star has

the first Navy "E" award in Maryland for production been made.

"Know-how" capable of producing these shields must be and is a combination of engineering skill, specialized experience plus equipment capable of shearing, rolling, forming, welding and assembling large, heavy, tough pieces in sections and sub-assemblies. The photographs and description which follows indicates that the Brandt organization possesses all these in abundance.

Photographs 1, 2, and 7 of shields completed, partly assembled and in process of fabrication, emphasize that production methods and equipment must be un-



Left—Photograph 3—The power shear, shown here cutting armor plate for a shield, is capable of shearing 1½-inch mild steel or armor plate 3¼-inch thick to the length of the shear. Shearing is the first step in production of the shields—most pieces requiring some shearing to dimensions or to shape.

Right—Photograph 7—The only final assembly fixture needed (due to use of subassemblies) is the simple base frame shown here. On this base the sub-assemblies are erected and clamped in place. Sub-assemblies are then bolted or welded without the need for any large fixture. All final assembly is completed at this station.



usual. For example, the pieces which make up subassemblies, of armor plate, are sheared to dimensions on a power shear (Photograph 3) with deep gap capable of cutting 1½ inch mild steel plate or armor plate ¾ inch thick in unlimited lengths.

After the straight shearing is done on the plates, the various door openings, access openings, and irregular contour cuts are accomplished by using large template automatic flame cutting machines and portable motor driven flame cutting machines. (Photograph 4) shows a portable motor driven flame cutting machine guided from a template.

The pieces are now ready for forming and, as Photographs 5 and 6 show, the long radii bends are made in a power roll capable of taking 1½ inch plate 12 feet long and other bends are made in a power press brake with a 16-foot bed and a capacity of ½-inch plate 12 feet long. Control of the press brake bends is maintained by suitable gage settings on the brake.

Sub Assembly for Welding

Pieces having been cut, provisioned and formed, the next step is the welding of sub-assemblies as shown in Photograph 8. Because the tolerance must be close, much thought was given to the fixtures and positioners used, so that each sub-assembly will be to exact dimensions and so that all welding can be downhand. Since these sub-assemblies are, for the most part, large and heavy, the fixture is also of substantial structural steel construction with heavy welded-on hold-downs, supplemented by quick-acting clamps.

Welding is done by the electric arc method, using alloy steel electrodes.

Welding of sub-assemblies being completed, the next step is to assemble the shield. Up to this point, as much of the work as possible is handled in the subassembly fixtures in order that final assembly can be accomplished in as simple a fixture as possible and with a minimum of final assembly jigs and fixtures. Photograph 7 shows the simple floor fixture on which the sub-assemblies are erected. Construction is such that using this floor fixture to hold the necessary base tolerances the sub-assemblies fit together for bolting or welding without any top fixture.

With all welding of sub-assemblies and all bolting completed, the shield is then lifted from the assembly fixture and placed on skids which accompany the shield onto its freight car. On the skids and put together, a crew then installs all hardware such as door frames, ladders, hinges, hasps, doors, etc. This crew also does the final touch-up of welds, inspection, etc., so that the shield is ready for painting (Photograph 2).

Brandt has a spray booth large enough to take the completed shield. After painting, the shields are given a final inspection and loaded on cars for delivery to

the Navy.

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The actual cutting, forming and welding of pieces presented few problems because the machinery was more than adequate, but the designing and building of jigs, fixtures and positioners for the assembly of the

various sections in order to maintain the tolerances specified required much care and thought. However, the type of work fabricated by Brandt pre-war to just as close tolerances in both heavy and light gauges, enabled the organization to meet these problems and overcome all obstacles.

History

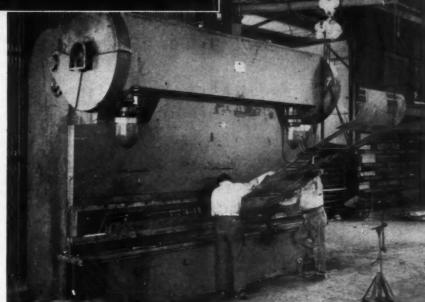
It is of some interest to follow the development of this organization since its inception. In 1890 Charles T. Brandt (now deceased), a sheet metal worker, opened his first shop doing small repair work in sheet metal. As the years rolled by, the shop became too small and in 1921 he moved to larger quarters. At this time, general sheet metal work was being done for the building trade; also the shop specialized in industrial plant work. The industrial plant work being more desirable, the firm concentrated in this field and gained the confidence of most of the industrial plants in Baltimore.

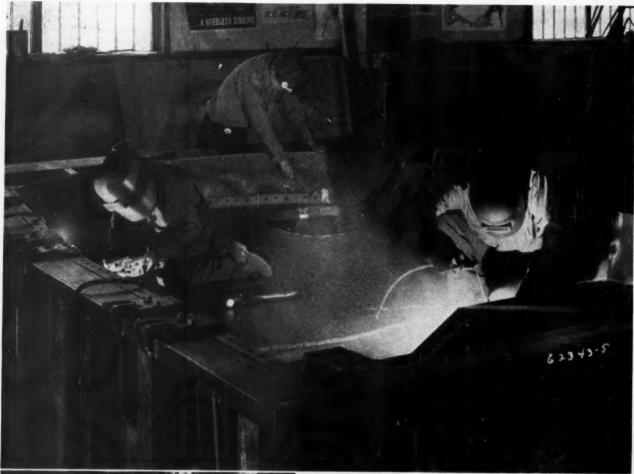
In April of 1930, the business was incorporated



Left-Photograph 4 - The portable, motor driven flame cutting machine, operating from a template is here making inside cuts in one of the side pieces prior to forming. Automatic flame cutting machines are also available and used for cutting several stacked pieces of armor plate simultaneously.

Right — Photograph 5—All sharp bends are made on this press brake capable of putting 90-degree bends in 1/2inch armor plate 12 feet long. A side piece, provisioned and with all openings cut and the top rounded is here being given a bolting flange.







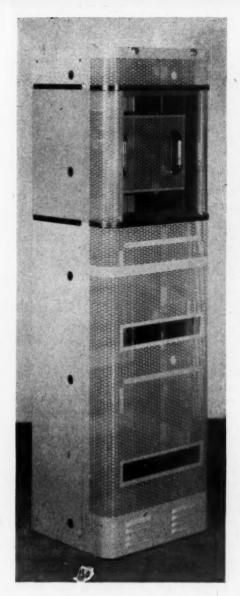
Above—Photograph 6—All long radius bends (like the top curve of a side sheet) are rolled in this power roll capable of taking 1½-inch mild steel 12 feet long. Metal templa'es are used to check the final curvature.

Above—Photograph 8—A typical subassembly fixture is shown here. Note the substantial structure. Heavy, bolt down clamps augmented by bolted on "holddowns" keep all pieces in exact alignment for down-hand welding. By using these accurate fixtures for sub-assembly, Brandt eliminated all need for elaborate final fixtures — the sub-assemblies were selfaligning.

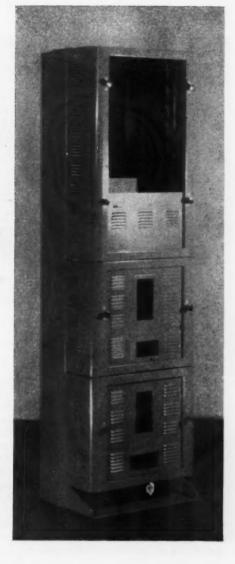
and continued to grow. In 1936, the firm moved to its present location, acquiring by purchase, 10,000 sq. ft. of floor space and adding, by construction, another 12,000 sq. ft. In 1939, 24,000 sq. ft were again added; 34,000 sq. ft. more in 1941 and 50,000 additional in 1942, and at the present time, other additions and alterations to take care of present requirements and at the same time looking forward to the post-war period.

Present operations cover a wide field, handling metals of all types, from the lightest up to 1¼ inch thick, together with light structural work necessary for the reinforcement, so the plant is a combination of sheet metal, steel plate work, and structural iron work; all of which is worked to precision tolerance.

Many unusual contracts have been handled, for instance, air-tight steel oxygen rooms using Silica Gel for humidity control, which is the only one of its kind ever constructed. Also, an electrolytic continuous tinning line unit fabricated of steel plates and structural shapes, all welded construction, being 6 feet, 6 inches wide by 53 feet long by 11 feet, 6 inches high, weighing 30 tons. In spite of this weight and size, the assembly was totally fabricated in the plant and shipped as a single unit.



A Furnace Dealer "Keep's 'em Jighting"



Two of the 9 types and 11 different fronts currently in production at the Mid-West plant. Note louvres, expanded metal opening frames—just two of the tolerance problems successfully solved. These two photos by John Hughes, a Mid-West employee.

WHEN a sheet metal shop, particularly one having some power machinery, starts producing close-tolerance war items, the story is interesting, but usually not unexpected. But when a furnace shop, whose only "power machinery" is a "Pittsburgh" machine and a spot welder and whose closest tolerance is that used on duct work and gutters, decides to take a war item contract whose complexity and tolerance made that item shunned by others—the story of that shop's experience is not only startling, but also worth studying.

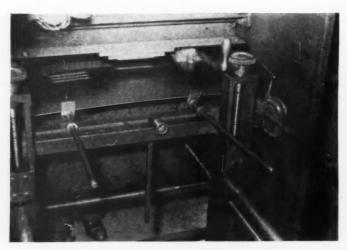
Up until the Fall of 1942, Mid-West Heating & Service Company, Indianapolis, had devoted its energies to building a house heating business. New heating systems, particularly automatic heating; plus a growing clientele of trust companies and mortgage firms with thousands of houses to service made it possible for Mid-West to grow steadily, buy a new building, and work 42 men—no mean accomplishment from scratch.

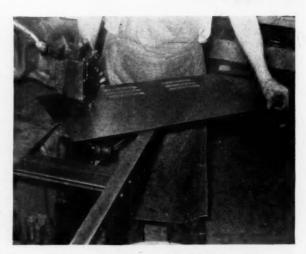
But in the Fall of 1942 President E. L. Carr realized that a major decision would have to be made in a hurry. The alternatives looked about like this: (1) continue as formerly with material and equipment dwindling and probably ending up working 3 or 4 men; (2) move out of and rent the new building to others and continue the heating business out of the

house or garage; (3) rent the building and close up the business entirely; (4) get some war work.

Not an easy decision to make under normal circumstances—it was especially difficult in 1942 when no one knew what to expect and no one could offer any good advice. So in the words of President Carr—"We went and sat in the laps of WPB and SWPC in Indianapolis; we went to Washington and Cincinnati; we wrote letters to and called on everyone who might possibly have something we could make. The results were—nothing. Next, we divided up our energies so that myself, our engineer and our superintendent all could canvass personally and continuously every concern in the Indianapolis area which was doing war work. We got a few orders—a few pieces of this, a few of that. It looked pretty discouraging.

"But what we didn't realize then was that we were getting acquainted with the men who did then or would shortly have sheet metal work to sub-contract, and they were beginning to believe that maybe we could make some of the hard-to-get items bothering them. Our orders slowly increased in size and number through the first months of 1943—we even got to the place where we could be a little bit choosey and reject certain items which did not lend themselves to our limitations of equipment and personnel. But we still hadn't cracked the problem of getting an order





Left—Die and gage setup (made in the shop) for punching louvres, one at a time, in the 4½-foot press brake. Right—irregular and inside openings are marked from template and cut on the Unishear. Both these machines bought for the cabinet contract.

which would keep us busy week after week.

"We began to realize then that if we were really serious about this war work business we would have to put an end to the limitations imposed by our lack of equipment—we would have to buy new equipment immediately. We decided to gamble—we shoved most of our old hand equipment into the corners and bought—one 10-foot, 10-gauge power press brake; one $4\frac{1}{2}$ -foot power press brake; a Unishear; a carborundum wheel high speed saw; two new spot welders; two No. 2 punch presses; one 75-ton power press; a burning machine to cut heavy plate; a 250-amp arc welder; one 35 KVA spot welder; an air compressor piped to all our machines.

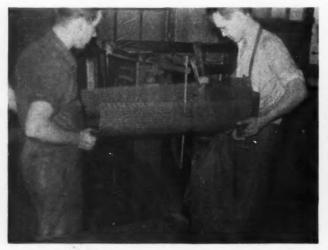
"But no sooner had we gotten the equipment than we began to realize that new machinery is only so many pounds of metal until someone who knows sheet metal production procedure gets maximum production from these machines. We needed a man who could improvise dies and gages; who could train operators; schedule the necessary provisioning, notching, forming, etc.—in short, get the work out. Our organization had no such man—but we found one after some little search, and production was made his 'baby.' Then we began to go places."

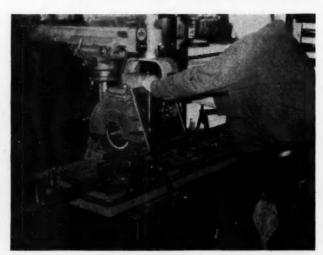
First "Good" Contract

The first substantial contract was obtained in March, 1943—it was for the first of the communications cabinets shown in process of fabrication in the photographs. Today, approaching one year of production, there are nine different sizes and types of cabinets with eleven different types of fronts.

Today, the shop force totals 37—35 men and 2 women—all working on war items. One shift is worked, total time 55 hours a week, six days a week. In addition, during much of the past year, two men friends who wanted some extra money, came in two or three nights a week for three to four hours, and spot welded or put together assemblies fabricated as parts during the daytime. Women have proved quite satisfactory; the two who work steady now are among the force's best producers. As many as four women have been worked and Mid-West would use more if they could be found.

Fortunately for Mid-West, a pretty thorough cost accounting system has long been in operation. To this, for war items, a time study plan was added. This combination has proved of immeasurable help because in a small organization of this kind, working





Left—Spot welding opening frames in expanded metal—a ticklish job because of the plus-minus 1/32-inch tolerance. Text explains how operation is handled. Right—High speed, carb orundum wheel saw bought to cut light structurals. Angle framing for rectostarter is being cut to gage set-up.



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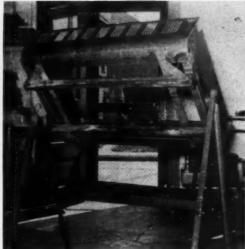
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One of the important problems was fixtures to hold all parts of a front in correct alignment during welding and to provide for all "down hand" welding. Left and center—Shop made fixture to hold four large front pieces; rotates 360 degrees; has excentric clamps. Right—Smaller fixture for small front showing clamps.

on several different contract orders, no man works constantly on one contract number. Men move from job to job during the day. The cost accounting system with suitable time cards keeps track of the moves. Also, time studies show how much time can be devoted to each operation and no matter who works at a job, the time is known and recorded.

The Communications Cabinets

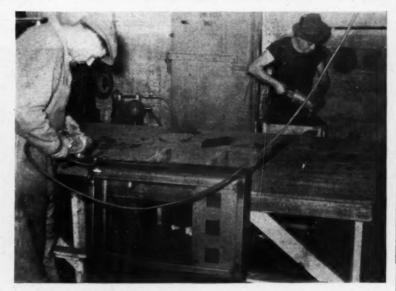
Most of the accompanying photographs show steps in the production of the communications cabinet and fronts. This housing is bolted down on ship board and contains the electrical equipment like transformers, electronic tubes, etc., which form the heart of a ship's communications or announcement system. The cabinets are pretty much alike except for size, but the eleven types of fronts differ considerably.

Generally, the cabinets are 16 gauge steel, with certain parts down to 22 gauge and several sizes of angles. Another war item in production is the housing for a rectostarter—a portable, motor generator set to produce electricity to spin airplane motors without using the plane's battery.

Early in the production of the communications cabinet, Mid-West encountered a number of problems solved as shown in the photographs. For example, it will be noted that many of the fronts and backs have louvres of several sizes. A die cutting and forming set with the necessary positioning gages was made for the press brake as shown and the louvres are punched one at a time.

On most fronts irregular openings require inside cuts. Templates were made to mark these openings and the cuts are made on the Unishear. Since each





After welding and inspection and prior to painting, all welds must be touched up and ground down with saucer or flexible wheels. Simple, shop made stands hold units for down hand grinding.

A sub-contractor does the spray painting, oven baking and wrapping. Left — Applying prime coat in spray booth. Right—Crew of women touch up any poor paint spots, attach hardware and wrap cabinets in paper for delivery to prime contractor.





such opening is finished with a separate metal frame, no die work on the opening is required.

A ticklish problem developed in fitting the frames in the openings in the expanded metal fronts. The expanded metal, as formed, is somewhat flimsy, so are some of the frames and, when completed, the whole assembly must make a perfect fit in the panel. No special method was found except that great care is taken to get all the frames true and to carefully cut the expanded metal so that there are no ragged edges and each opening forms a "press" fit in its frame. Finally, two or three men hold the pieces in alignment during the spot welding.

Fixtures

Most of the front panels are composed of two sides, a top and a bottom piece which must be welded together before the expanded metal is applied. Welding is done with the gas torch on the inside of the corners and to get a good weld all welding must be down hand, so fixtures were built in the shop to hold all four pieces in exact alignment. With the pieces held in position with excentric clamps, the fixture can be rotated 360 degrees, to bring all welding under the operator. It

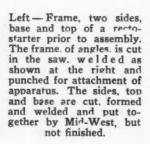
was not found necessary to provide end over end rotation. These fixtures, which are shown in three photographs, were designed by the shop force and built up of angles and bars welded into a solid fixture.

These fixtures made it possible to meet the critical tolerances specified for fronts. In final outline a tolerance of plus or minus 1/32-inch is specified; holes must be within plus or minus 1/32-inch; inside edges of the fronts must be plus 1/64-inch to zero.

One of the tough problems in tolerance developed inside the cabinet where the upright angles are punched with holes to take adjustable racks. Specifications called for a tolerance of 1/64-inch between holes horizontally and 1/64-inch between holes vertically. Since some of these housings are several feet high it was quite a trick to keep the dozens of holes so accurately lined up, but skillful press brake work in forming and careful punching turned the trick.

The final step in production is finishing. Mid-West is not equipped to finish so this work is sub-contracted. In order to get a satisfactory finish, Mid-West does have to grind down all welds and touch up rough spots

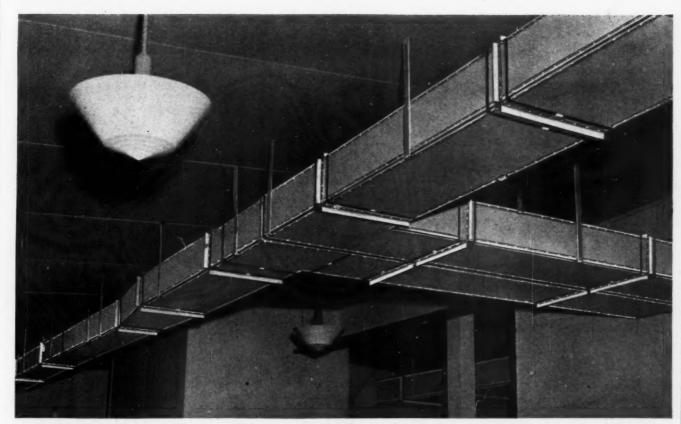
(Continued on page 194)







AMERICAN ARTISAN, January, 1944 SHEET METAL SECTION



Typical 1943 model asbestos-cement duct "strapped" for rigidity and put together with economical "Sheetlock" connectors.

Section needs no more than eight bolts or screws.

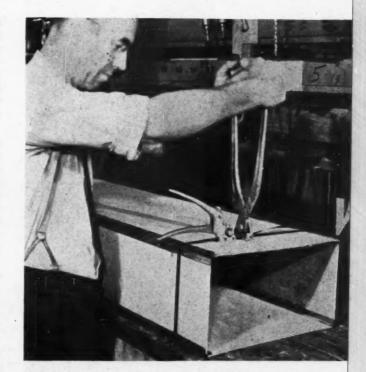
Strapping Makes Strong Non-Metallic Ducts

ROBABLY the most interesting development of 1943 in the fabrication of non-metallic ducts, centered around the use of steel strapping to stiffen ducts—especially ducts of large size and built of asbestos-cement sheets, 3/16 to ½ inch thick—the strapping accomplishing three major results: (1) making possible lighter metal connectors, (2) eliminating use of metal screws and bolts, (3) reducing cost of fabrication and erection up to as much as 40 per cent.

When large ducts of ¼-inch asbestos-cement first were specified a couple of years ago, contractors quickly found that this heavy material required a new technique. First, the panels had to be cut and erected in place one at a time because it proved impossible to assemble a large section on the floor and raise it into position without great danger of the whole section falling apart. This erection piecemeal increased inplace cost tremendously—more man-hours, more men, more horsing around.

To offset this, contractors went to heavier and heavier metal connectors on the theory that a heavy enough connector would provide the stiffness necessary to hold a section together. And right along with the heavier connector went the more generous use of screws and bolts in an attempt to hold the pieces together. Eventually, metal connectors as wide as 3 inches and formed in 16 gauge with screws or bolts on 2 to 3-inch centers were tried; the result did not prove too successful.

To what individual should go the credit for first



Signode Steel Strapping Co. strap-applying equipment has put tension on the strap to pull board and connectors tightly together. Strap is being "sealed". Picture on Sheet Metal Section cover shows Acme Steel Co.'s equipment in similar use.

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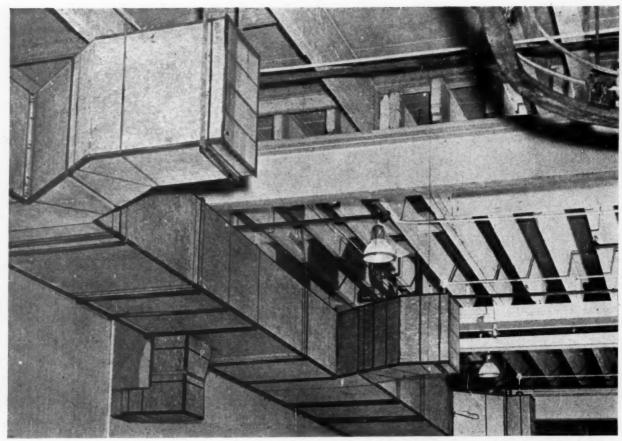
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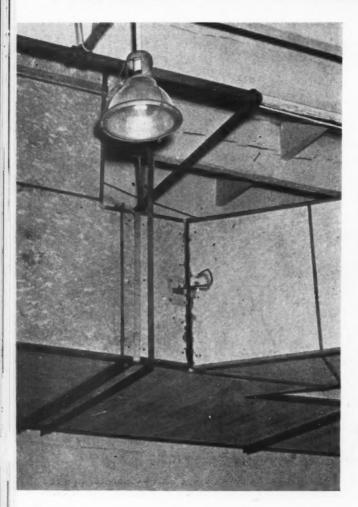
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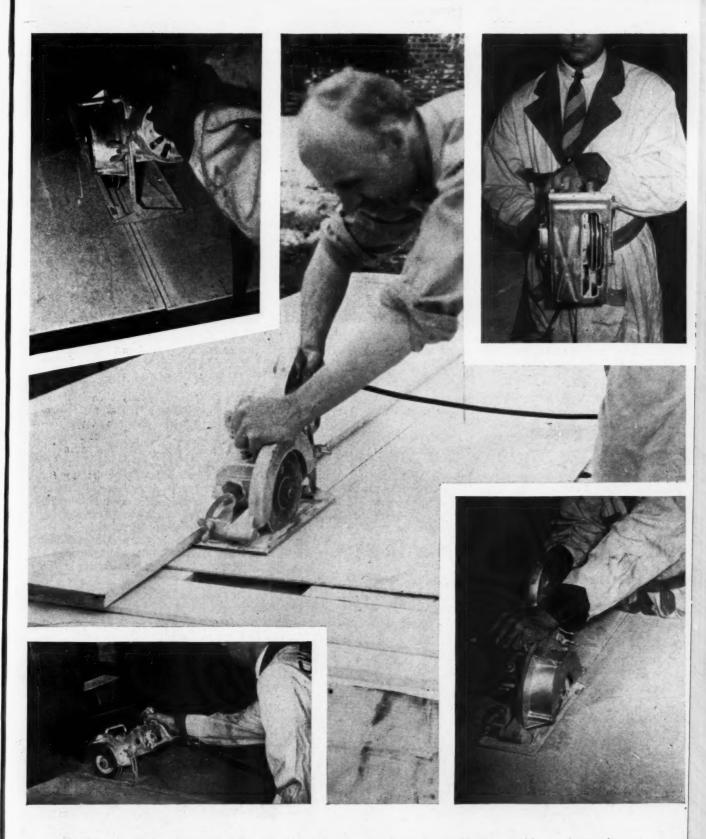


Partial view of non-metallic ducts used in Heat Treat and Plating area at the Curtiss-Wright Propeller Division plant in Indianapolis and, below—closeup of a register stub in same system. Duct work fabricated with "Sheetlock" connectors and metal strapping by the Nyland Sheet Metal Co., of Indianapolis. Nyland uses formed channels top and bottom (strapping runs through channel) to prevent board sagging. Screws in top channel hold board to channel.

thinking of metal strapping we do not know, but it was a good idea and contractors all over the country have used the idea with success. The idea is simplethe asbestos-cement panels are cut to size and properly fitted with metal connectors. Probably the lightest connector used is the "Sheetlock" strip in one of its several forms. The double pocket, flat sheetlock strip for 1/4-inch asbestos-cement board is only 28 gauge and measures only 1 inch wide across the outside; the 90 deg. angle Sheetlock (for corners) is also 28 gauge and measures just 5/8 inch on a leg; the U Sheetlock strip is 26 gauge and is 9/16 inch wide on the inside leg. These dimensions and gauges indicate how much lighter the metal connectors can be with strappingthe resulting duct section is infinitely more flexible and stable.

We mentioned that contractors tried many bolts or screws in their heavy metal connectors. Contractors reported from 90 to 196 bolts used in a single 8-foot section—that's expensive. Strapping eliminated practically every one of these bolts.

Furthermore, with heavy metal connectors and many bolts the asbestos-cement sheet was apt to break out along the line of bolts if any pressure was put on the duct section to force it out of true rectangular. This was caused, no doubt, by the fact there was no "give" in the heavy metal connector—the board edge had to "give." The light metal connectors, on the other hand,



Ways and means of cutting asbestos-cement board quickly, smoothly and simply have resulted, generally, in the use of the portable electric saw using a carborundum wheel. A simple layout is shown in the center picture — two boxes on the ground plus some planks to hold the board plus a straight edge along which to run the saw. The four inset pictures show a three-bladed "Skilsaw" which cuts the board and, simultaneously, runs two grooves in which the notches of "Sheetlock" connectors slide and hold.

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Bloomer Heating & Ventilating Company, Chicago, insures smooth air flow through 90-degree asbestos-cement elbows by the use of metal turning vanes. The blades are cut and formed and riveted to the top and bottom strips as shown (left) and the complete assembly is installed as shown (center). Connector strips are cut with a hack saw in a simple clamp-down fixture (right).

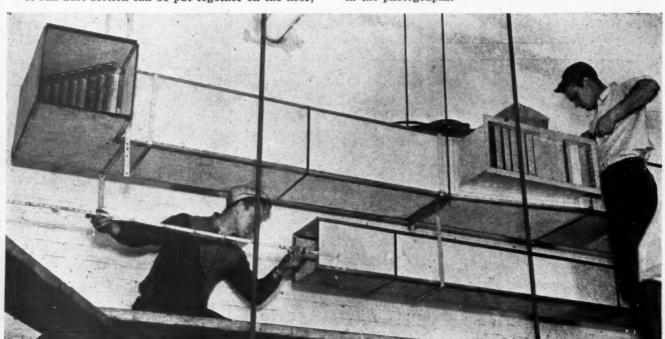
have considerable flexibility so that the connector can "spring" and the bolts or asbestos-cement sheet does not take any strain.

The application of the strapping is simplicity itself. The asbestos-cement sheet is inserted in the pockets of the connectors and perhaps one bolt or screw at each end is run in to hold the metal and board together. Then the strapping is run around each end (see photographs) and the strap applying equipment pulls the board edges up tight into the connector pockets and puts as much tension as wanted on the strap. It is possible to "squash" the duct if that much tension is wanted, but experience quickly shows how much tension is best.

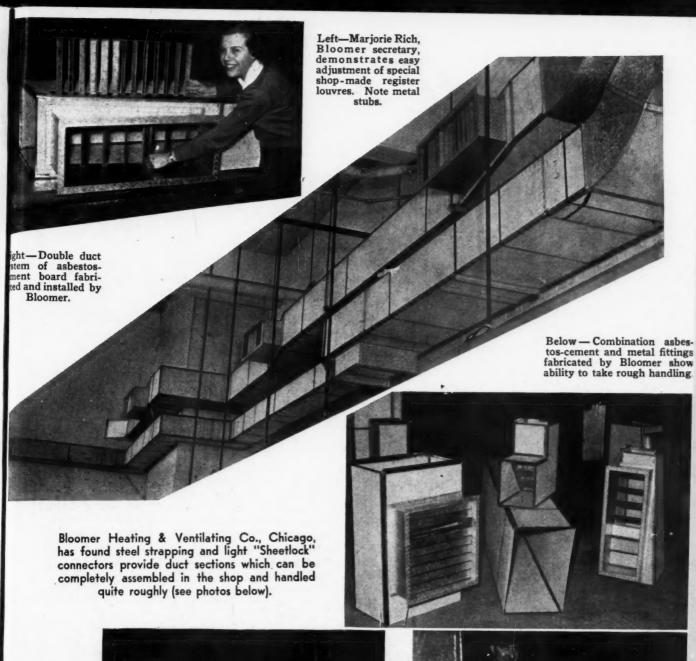
A full duct section can be put together on the floor,

ready to hoist into position. Assembly then becomes more nearly comparable with standard all-metal procedure and cost "in place" approaches a cost per foot comparable with all-metal on large ducts, but remains higher on small ducts and on fittings. This saving in cost must be credited mostly to the use of strapping which eliminates the cost of punching or drilling for bolts, the cost of bolts and screws, the labor of putting in the bolts or screws, considerable saving in manhours because a full section can be put together for erection instead of erection panel by panel.

Finally, as the photographs show, a strapped duct will take considerable abuse without falling apart—this is important in large ducts similar to those shown in the photographs.



Asbestos-cement ducts with "Sheetlock" connectors and metal strapping fabricated by Bloomer Heating & Ventilating Co., installed in a department of the Buick aircraft engine plant in Melrose Park, Ill. Note turning vanes in elbows (shown above) and adjustable registers. Register stubs are metal.







AMERICAN ARTISAN, January, 1944

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Big Hoods -

For A Heat Treating Department

Frequently, hoods above heat treating tanks, where it is necessary to lift materials into and out of the tank, are suspended hoods open all around and depend for fume removal on exhausting of large quantities of air. These closed hoods, requiring far less air, give the user economy of operation at no sacrifice in efficiency.

POR the removal of heat, steam and fumes in a heat treating department, the Charles Schroeder & Sons, Inc., of Bridgeport, Conn., designed and installed the two-hood system shown in the accompanying sketch and details.

Each system exhausts to the outdoors; the De-Bothezat fans being hung as shown in Detail 4 in an angle iron cradle attached to the exterior wall. The West System exhausts 6,880 cfm; the East System 9,000 cfm.

Equipment Layout

The plan of the East Unit shows two electric furnaces, a water quenching tank and an oil-treating tank, all grouped compactly together along a common front. Work is introduced into the furnaces and tanks and is removed at the front, so the problem was to design a hood which gave free working clearance at the front with the back and ends closed in to keep heat and fumes from spreading.

These specifications resulted in the somewhat unusual shape of the hood as shown in the End Elevation A-A. The front edge of the hood is straight and level projecting 42 inches ahead of the equipment, pitching apward steeply above the front of the furnaces and tanks to allow work to go into and out of the equipment; then pitching steeply downward at the back for connection along the back edges of the equipment. As the plan shows, the equipment has different depths so the back wall of the hood is a series of steps.

Hood Construction

Both hoods are identical in construction—the material is 18-gauge black iron formed in panels 33 inches wide. The two edges of each panel sheet were formed to make a standing seam with the adjoining panels as shown in Section X-X. The low, rear wall conforms

with this top construction. The panels were made up in the Schroeder shop and were seamed in place.

Because this hood is almost 20 feet long and almost 10 feet deep the weight is considerable so substantial support was demanded. End Elevation A-A shows the method of support—3/16 by 2-inch hanger bars along the front edge on 42-inch centers; the ridge hung from the trusses by four 10-gauge hangers as shown in End Elevation A-A and Section X-X. The rear wall is bolted tight to the equipment as shown in Detail 1.

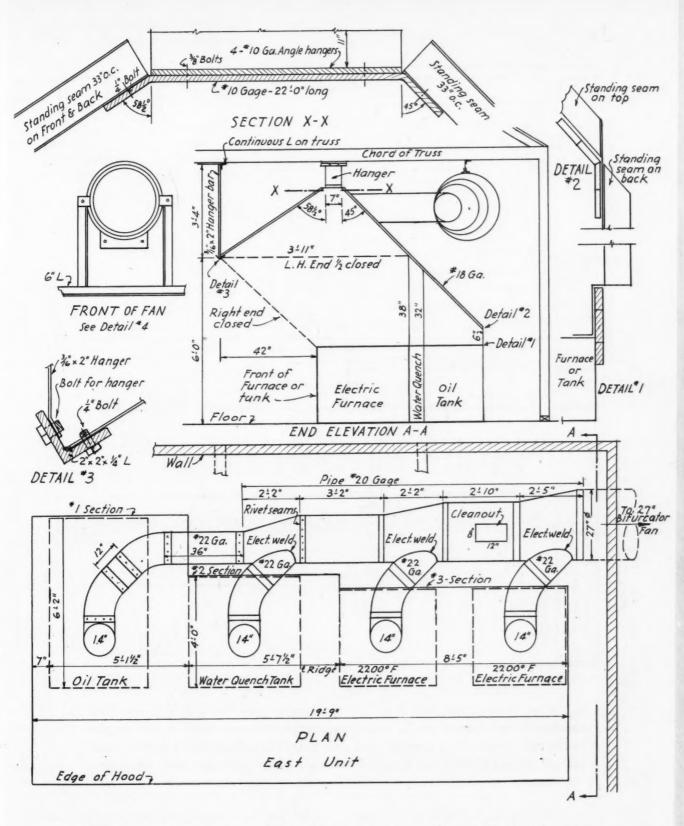
Erection Procedure

In erecting, the four ridge hangers were first bolted in place, then the continuous ridge channel (special 10-gauge formation) was bolted to the hangers. Next the continuous front angle (see Detail 3) was erected on the six bar hangers which are fastened to a continuous angle across the trusses. The back plate on the equipment (Detail 1) was then fastened in place and the back wall erected with the angle shown in Detail 2 in place ready for the top. Finally the front and back roof panels were placed in position and seamed together.

Round Pipe Lines

All exhaust is taken through the back slope of the hood using 22-gauge round pipe branches and 4-piece elbows—branches connecting into the 20-gauge main which is progressively enlarged to keep velocity uniform through the main. No special fitting was used to connect hood to branch. The branches were made up in riveted construction in the shop ready to place and connect.

The plan shows that the connection between branch and main is arc welded, so these Y-branches were made up in the shop ready for riveted connection to adjoining main sections and branch pipes. The main is sup-



Under the East Unit the tanks and furnaces are arranged in a straight line, permitting a flush, overhanging hood as shown in End Elevation A-A. The closed back is "stepped" to accommodate different depths of equipment. Section X-X and Detail 3 show the substantial hood support developed by Schroeder. Piping system is welded fittings with riveted sections to facilitate erection. Details of the West Unit are shown on the page following.

AMERICAN ARTISAN, January, 1944 SHEET METAL SECTION

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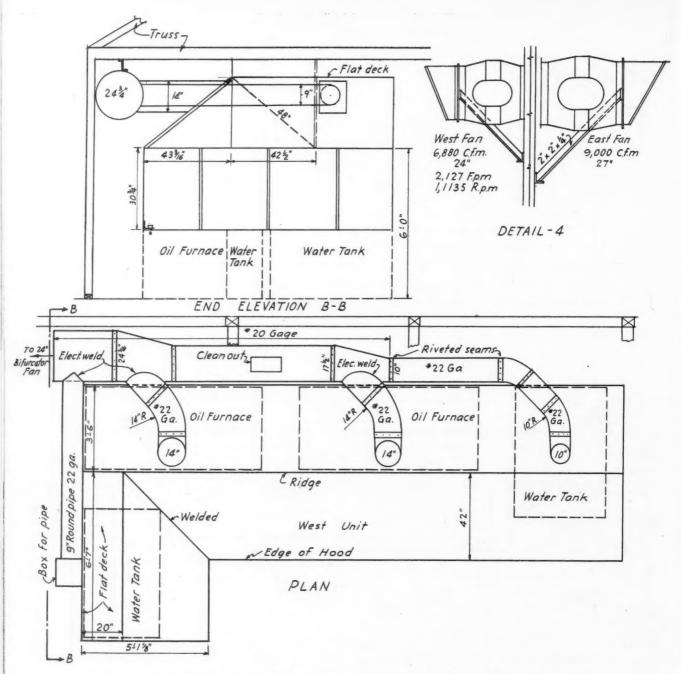
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In general construction, this West Unit is identical with the East Unit, but here one tank forms a leg of an "L" and necessitated a second hood at right angles to the main hood. A separate exhaust pipe insures this smaller hood getting equal exhaust. Hoods of both legs coincide for appearance and operating efficiency.

ported at frequent intervals by wrap-around band hangers bolted to angles on the trusses.

The West Unit differs in plan in that instead of being straight it is L-shaped to include a water tank at the side. Construction of the hood and piping is identical with the East Unit and the valley formed between the two legs was arc-welded after erection. The front slope of the short hood is not standing seam, but flat, in one piece.

This West Unit stands 30 inches clear of the equipment (6 feet above floor) on all sides, including the back, so in erection the hood support angles—front,

ridge and back—were hung first and the standing seam roof placed and seamed. Then the back wall (see End Elevation B-B) was erected to close in the equipment.

To complete this contract some 4200 pounds of steel sheets plus 800 pounds of angles and bars were required.

The construction has elicited praise from the customer because the hood permits free access to equipment, confines heat and fumes to the immediate equipment area, has all piping out of the way in the back, and eliminates a previously objectionable condition.

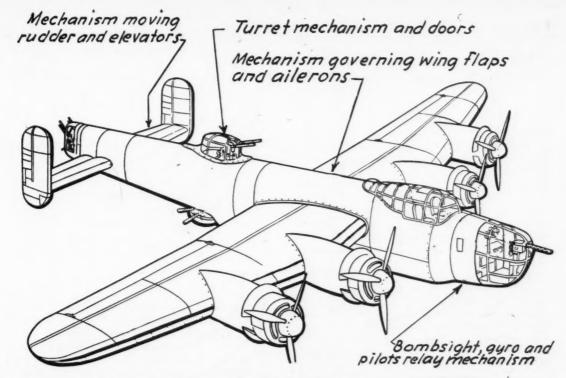


FIG. 2 LOCATIONS WHERE HEAT IS NEEDED

Temporary Dies and Fixtures

(Plane Heating Systems - Parts Required)

By Ernest E. Zideck Sheet Metal Consulting Engineer

As the plane builders advance from the initial to a more standardized production, more and more of the smaller items are being subcontracted. Among these items are numerous ducts, transitions, manifolds, air mixers, shields, air distributors and similar sheet aluminum or stainless steel accessories required for heating the interior of the craft. This heating is less for the comfort of the personnel manning the plane or the bomber than it is to keep the intricate mechanism and instruments in good working condition in the extremely cold atmosphere to which aircraft rises. The modern bomber especially is a maze of electrically operated mechanisms which fail to function if the cold causes the lubricant to congeal.

In Fig. 2 of this installment we see a bomber and the notations on the fuselage show the general locations of instruments and mechanical units which must be kept warm. In the nose section we see the location of the bombsight, an intricate mechanism which fails to function in extreme cold. We also see the flexiglass portion of the bombardier's and pilot's cabin; the flexiglass must be constantly defrosted by artificially conducted heat distributed near the panels. Also in the pilot cabin there is the gyro, the auto pilot, which fails to function in a too severe cold. The upper

notation shows mechanism operating the turret, and to it applies the foregoing in a much larger degree because the turret moves on a large area, and is effected to a greater degree, therefore, by cold which causes the lubricant to congeal. In the section where wings and fuselage join is located mechanism governing the operation of the flaps and the ailerons. Without instant response of this mechanism to the touch of the operator, maneuvering of the craft would be impossible. In the space below the fin are located instruments which control movement of the elevator and the rudder.

In the aft section of the craft we see exposed the mechanism governing the hind turrets, and what is true of the other instruments applies to the aft gunner's mechanism as well. The interior of a modern bomber is crowded with instruments, electrical relay stations, rheostats, cables, wires and an unbelievable array of accessories which take up all the room and cause the personnel of the craft to exercise acrobatic prowess in moving around. It is into this maze of projections and of preempted space that the air ducts are installed. The duct, seldom exceeding 7 inches in diameter at the start, branches out into dozens of round and rectangular and other shape tubes, the

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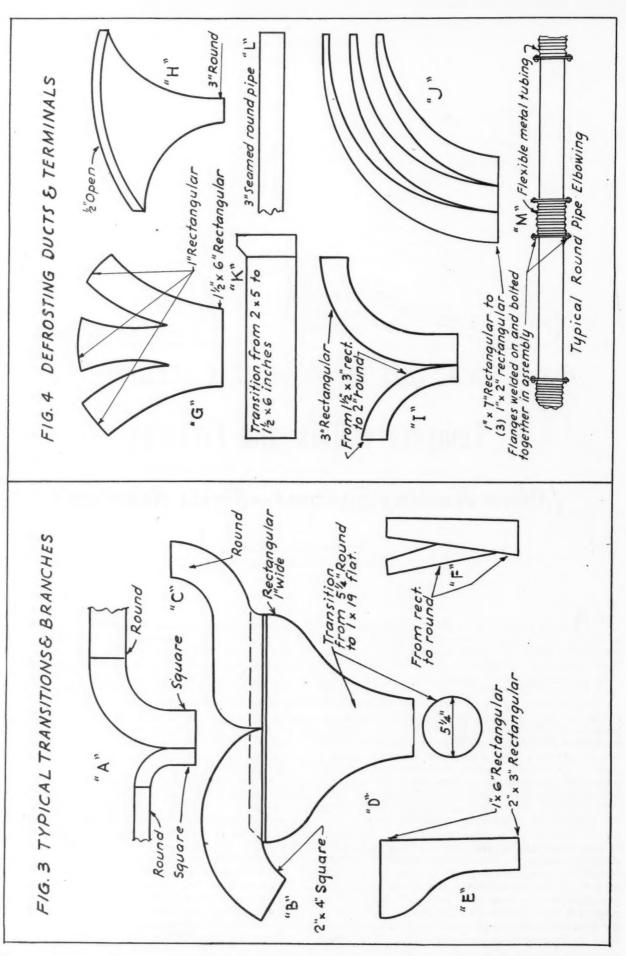
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branches winding their way like worms to get by this or that obstacle and still admit of free, unhindered air flow.

There have been three kinds of heating in vogue. The first system imitated the conventional house heating, taking the hot air from the engine housing and blowing it into the ducts. The second system (with which we are dealing here), takes the heat from a supercharger and conducts it to an air mixer, the reversible motor operations permitting of the heat being blown into the interior of the craft and, when needed, exhausting the stale air by the same means, blowing the air to the rear of the wing. The third system, finally, utilizes electric heating units placed under or about the vital instruments in addition to the foregoing.

The "Air Mixer" or "Heater"

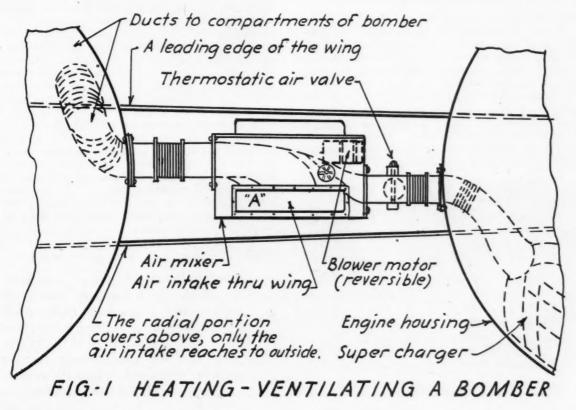
In Fig. 1 we see a typical arrangement of an air mixer placed into the wing (before the leading edge is bolted to it). The dotted lines at the right indicate the supercharger and the lead through the engine housing to the opening in the fuselage at the outside wing. Here it is of interest to note that the elbowing of the duct is accomplished by flexible tubing sections, welded onto heavier gauge metal flanges, connecting by other such flanges to the duct section that follows. These flexible tube sections are not very long, 4 or 5 inches suffice for bends not exceeding 50 degrees. Obviously, the longer the flexi-tube, the larger the degree of elbowing possible. This kind of elbowing has the second advantage of the elbow withstanding the strain to which every part of the craft is subjected at times. A third advantage of the flexi-tube lies in the fact that it is easy to install and bend to any of the lesser degrees desired.

In the exposed part of the wing front we see that the initial duct coming in from the engine nascelle is provided with an electrically operated air valve, the valve admitting as much heat as the duct will carry, or admitting as much as desired. The air mixer itself is a sheet metal box provided with interior baffles and partitions. The motor and the blower are small, but they are fully capable of taking care of all the heat the duct can carry.

The frontal opening in the box, marked "A", connects by a short sheet metal duct to the "leading edge" (a rounded part of the wing that "leads" into the air). Through this opening in the leading edge is blown in by a force which equals the speed of the craft through the air, a volume of air that, mixed with the heat from the supercharger, reaches into the smallest of duct branches and mere 1 inch round tubes, carried by the force to the farthest corners of the interior of the ship. The opening on top of the box marked "B", receives the surplus fresh air from "A" and discharges it into the interior of the wing itself. When heat from the supercharger is blown in by the blower, the fresh air simply travels through "A" into "B", without being allowed to mix with or affect the extremely hot air coming in from the engine. In the duct connections shown by dotted lines at the left of the picture, we see the initial duct assuming a larger diameter and branching off, the larger duct leading to the rear and the smaller branch winding its way to the front of the craft.

Ducts Look Like "Worms"

As stated, the interior of the bomber is a maze of bulkheads, projections, turrets, instruments, cables, wires, pipes and mechanism. The initial duct crawls like a worm through and around the multitude of obstacles in its way. In Fig. 3, under A, B, C, D, E and F are illustrated a few of the transitions from round to square and vice versa, the obstacles in the ducts' way necessitating many flattenings down, like in the picture marked B, C, D, where a 5½ inch diameter pipe is transitioned into a 1 inch wide rectangular



shape to by-pass a turret, and then assumes a round and square form again to progress farther in the ship. Under "A" we see a typical transition and branch, this particular construction repeated in larger and smaller variations dozens of times. It must be observed in this connection that the two branches seldom are on the same plane, the rule being, rather, to form more or less pronounced angles, the one branch pointing in a different direction than the one opposite.

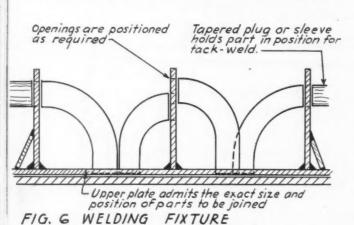
Fixture to Weld Ducts

In welding together the branches it is important that the exact size of the part together with the right direction of the elbow be maintained. In Fig. 6 is shown a simple Welding Fixture. Its base consists of two plates one arranged above the other and welded or riveted together. The upper plate has openings admitting the round or square or oblong ducts to be joined. The lower plate serves as a base on which the edges of the metal come to rest, with the upper plate holding the parts in exact position. In the uprights of the fixture are openings for the branch-ducts, positioned exactly in the required height or distance, the position being the one which the particular branch is to assume.

The openings in both the base and the upright having been made by a careful layout, the fixture serves as an inspection. If the duct does not fit in between the openings it must be trimmed. With the part fitting the openings we also are assured of the specified height and branch-out in width of the elbow. Tapered plugs or sleeves are used to hold the elbow in the upright position. These plugs are tapered to enter easily through the opening in the plate and then into the pipe. By pushing the plug in as far as it will go we obtain the right position for the part and we secure it in the fixture for tack-welding. Once tack-welded the construction is disengaged from the fixture and welding is completed on it.

Flexi-tube Elbows

In Fig. 4 we see several other shapes of heat-ducts, G and H representing terminals of the Defroster, and K, L, I and J showing other varieties of transitions. Under M is seen a typical "flexi-tube" arrangement which permits the duct being elbowed alongside of the uneven wall or floor. In a subsequent installment of this series we shall go into the manufacture of these transitioned and multiform elbows and manifolds, discussing the processes as applying to the one or the other product and showing self-constructed tools and fixtures by which it is feasible to accomplish economical and satisfactory production.



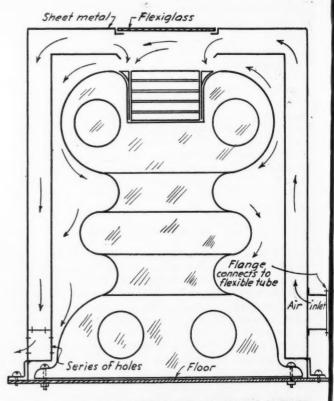


FIG. 5 HEATING MECHANISM & INSTRUMENTS
Enlarged view of air chamber around a mechanism

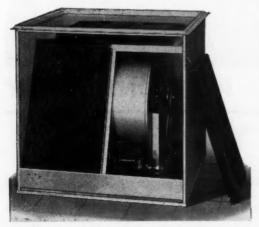
In the article to follow we also shall enlarge upon the "instrument heating" by hot air as disclosed in Fig. 5 of these drawings. This type of heating in which the mechanism is enveloped by hot air is just now coming into prominence. Similar "shields" or double-walled covers are being ordered for the electrically heated units, the double-walled cover over the instrument preventing the heat from the electric element dissipating away from the mechanism which it is to keep warm. These shields and covers assume just as many outlandish shapes as do the foregoing ductelbows and branches. Some are simple, others are of a complicated shape necessitating careful calculation as to the best method of fabrication. But at the bottom of all these items are the age long principles of sheet metal working, and we need only to apply these principles and supplement with the right choice of method and of tools to overcome the seeming obstacles in the way of a successful manufacture of these accessories. In the coming installment we shall also disclose the prevailing methods and processes and the application of machines and tools in the large aircraft plants, giving the reader an insight into production of these and similar sheet metal parts as practiced by the plane builder.

Part 2 of this description of plane heaters will appear in February. Part 2 will explain the interesting Hydro-press (rubber) method of forming metal plane parts; also the limitations of the hydro-press and the various hand forming methods employed in aircraft work to supplement "rubber" forming.

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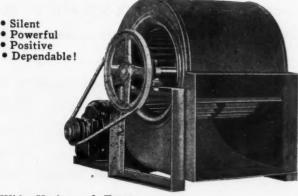
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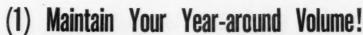
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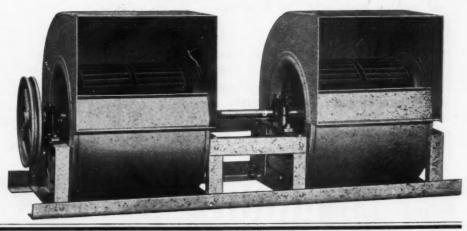
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Write for Bulletin No. 407-A

TAYLOR ST. GRANT WILSON, INC. CHICAGO

Post War Planning

Is Theme of NWAH&AC Meeting

OR the first time since Pearl Harbor, the manufacturers of this industry, meeting in Cincinnati, gave thought to and discussed in open meeting aspects of the post war market for heating equipment. Said retiring President Harold Sharp: "This industry should be thankful that we have been permitted to manufacture some heating equipment despite material shortages. Some industries have been stopped completely. We have faced and solved tremendous problems, but we are, as an industry, still in one piece. We may anticipate a tremendous post war market for our products and services, but we are going to see keen competition for the home owner's dollar from the auto, refrigerator and appliance industries. We are prepared for post war engineering and production problems, but we are not in too good shape so far as our dealer organization is concerned. Post war it will be the dealers who must carry the ball of sales and installation. Only if our dealers sell aggressively and install intelligently will this industry prosper. Codes of installation probably will not be enough, by themselves, to insure adequate engineering and satisfactory installation. The dealers must know how to and must be willing to install properly if warm air heating is to retain its leadership post war. Dealers need more engineering instruction, more text books; perhaps they should be members of this association. And we need new dealer blood."

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H. P. Mueller, President for 1944

War Labor Board

Speaking largely off-the-record, Walter Seelbach, manufacturer of furnaces and member of the War Labor Board, 5th Region, said that under certain circumstances the War Labor Board or some form thereof might continue after the war as a means of keeping wages and labor problems from getting completely out of hand. He explained in some detail how a WLB operates and assured members that generally the board members are "pretty keen" men, with considerable knowledge of labor problems. The basic purpose of WLB is to stabilize all wages and salaries under \$5,000 a year-wages may not be increased or decreased without WLB permission; employers agree not to lock out employees, and employees agree not to strike without WLB arbitration. In the beginning, Mr. Seelbach reminded his audience employers agreed to permit union organization, but employers did not agree to any check-off system.

Stabilization does not necessarily mean "fixed" wages, but it does mean an orderly relationship with costs of living. Complete procedure is available whereby any ruling by a local board may be carried up through the area, regional, national boards—even to the President himself. Employers need not accept the ruling of the WLB representative but can demand a full board hearing, and prior to such hearing should consult with the industry panel member in order that all facts are brought out in the hearing.

Post War Construction

As always interesting, Thomas S. Holden of the F. W. Dodge Company again reported his company's forecast of building for 1944 and for post war.

Laying some of the "hobgoblins" of post war worries, Mr. Holden said the nation's heavy debt made it pretty certain that a whole lot of government control—direct or indirect—may be expected. Also that many of the "super-duper" houses, machines, gadgets Americans are being led to expect in wild advertising probably never will materialize, or if they do it will be years before their acceptance. All we are getting from these flights of fancy, said Mr. Holden, is some stimulating mental exercise.

Mostly, said the speaker, Americans are dreaming about houses and the equipment which will go into homes, but when all is said and done, a house always has been and always will be just a place to live in and shelter against the elements, and houses are not means for keeping mass production lines running or means of meeting sales quotas, so drastic changes are not to be expected and the building volume will not reach the astronomical heights pictured by some of our dreamers.

In the period 1920 to 1929 we built an average of 700,000 new houses each year; that was a period of great population increase, family movement, and if the post war period bears any comparison we should

look for 500,000 to 700,000 new housing units a year for several years. There is a greater shortage now and more money per family.

If we attain the goal of 100 billions of national income a year and if we spend about 13 per cent for housing, we should have about 13 billions spent on housing. Probably an appreciable percentage of this will be spent in remodeling, and the heating industry should enjoy a tremendous market for modernization and replacement.

F. W. Dodge Company forecasts two-thirds of all new construction will be single family houses—very much to our advantage. In order, single family houses should come first, then specialty structures (stores, theaters, etc.) and finally apartments. We should also look forward to a period in which there will be greater demand for basic materials than supply; there should be growing use of the new light metals; and we should do our part to provide new and improved (but not necessarily revolutionary) heating equipment.

Indoor Climate Institute

Reporting on progress of the Indoor Climate Institute, Paul Zimmerman said the ICI does not expect to get all 800,000 new house heating plants for central heating and warm air may not get all the replacement business, but post war looks like a big heating market. Revolutionary equipment is much talked about, but probably will not be so revolutionary when actually introduced.

The most important post war problem, believes ICI, is to get heating equipment properly installed. Most of the poor installations have been due to the contractor agreeing to the builder's or customer's specifications despite the fact that the dealer knows these specifications mean a poor system.

ICI now is fully organized, staffed and financed. ICI will not sell or recommend any type of equipment but will guarantee indoor comfort if the specifications established by ICI are met. ICI believes that heating should get a larger percentage of the building dollar in the post war era and is pointing all its efforts to get acceptance of the importance and benefits of good indoor climate. The problem is to make the home owner demand better indoor comfort than he has obtained in the past.

Post War Conversion

Speaking at the luncheon, Frederick V. Geier, Chairman of the Cincinnati Committee for Economic Development, reminded members that American industry has gone on record as promising 40 billion dollars more wages and 9 million more jobs than the nation has ever had before in peace time. If industry meets that promise, every industrialist will have to do things he has never done before and mass production and mass selling must be stepped up in tempo to a level reached only under the impact of war.

Industry does not accept the theory that there are "no more frontiers" for post war; there will be more new products than ever and materials, methods, products to be available will make the American standard of living, in truth, a new frontier.

Manufacturers can begin their post war planning by listing their products under such classifications as follows: (1) products OK, as is; (2) products requiring major changes; (3) products requiring minor changes; (4) products no good, to be junked; (5) brand new products.

With the products so classified, the next step is to determine the length of time required to put each

product on the market. For example, a product which is OK can be put on the market as soon as production starts; a product requiring major changes may require many months to redesign, tool-up, produce. In planning now, then, most thought should be given to the products requiring the longest time to get on the market. By following such a plan, a manufacturer can get all his products on the market as planned and will not find himself faced with months of preparation when he should be selling a product.

Finally, a market analysis should be made to establish the approximate number of units of each product which can be sold. This will determine how large a force is necessary and how elaborate a production set-up is needed.

Length of time required to produce plus number of units to be sold establishes how many men and how much equipment a manufacturer can expect to operate—all manufacturers added together will determine whether or not industry will provide 40 billions of new wages and 9 million more jobs.

OPA Reports

From Washington, Orin McCorison, of OPA, said OPA has two major jobs to do: (1) prevent inflation, (2) establish maximum prices at a point where the cost of and the requirements of war production are satisfied and favored. McCorison said there are many figures showing how much cost of living has increased, but OPA believes that a fair figure will show that cost of living increased about 5 per cent in 1943 and the American public saved some 61 billion dollars which would have been spent if inflation was left to its own spiral.

That war production has been satisfactorily established is shown by figures of 162 billions of total production (for war and civilians) as compared to 80 billions of production in 1929. OPA expects 1943 will show about 60 billions of civilian consumption. Maintaining existing profit margins has not been enough—industry must also absorb increased costs of production. OPA will grant price increases only if (1) the product is essential to the war effort; (2) there is an actual shortage of the product and increased production can be obtained only by attracting new production at higher prices; (3) there is proof that the ceiling price reduces essential demand; (4) there is proof of actual hardship due to lack of the product.

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Roughly, the procedure in determining a price ceiling is to take the selling cost as a percentage for the industry as a whole, add overhead costs and production costs, and arrive at a ceiling. This, of course, penalizes high cost producers—may even put them out of production. However, in determining production costs, the costs of a high cost producer are used rather than the figures of the lowest cost producer.

The nine per cent increase granted to producers of cast iron furnaces was only a temporary measure, said Mr. McCorison, and additional investigations are under way (December 8) to determine if additional costs should be permitted.

Radiant Heating

H. F. Randolph, International Heater Co., presented an interesting discussion of the warm air radiant heating installation in Utica. This installation is practically identical with the installation described in the January, 1942, ARTISAN, also an International project. Mr. Randolph's report brought the operation of this installation up to date and furnished operating data. The January, 1942, article in the ARTISAN only

described the system. Since this report is quite lengthy and is of no value unless reported in full with operating charts, the paper will be published in a later issue.

Research Staff Report

Professor S. Konzo, reporting on the research program during the past six months, announced that tests are under way on the Fellow's smokeless furnace. Patents on this furnace are held by the University of Illinois Foundation and licenses to manufacture are being granted on a fee basis. A new Bulletin 348 will be ready for release shortly and will cover fuel conservation tests such as use of fireplaces, thermostat location. Another bulletin will cover heat loss from ducts.

Professor Konzo reported some progress on the text books for dealers and said the present thinking is a series of small handbooks, each covering one or two subjects and written for use in schools. Commercial Standard for coal burning furnaces CS 109-44 has now been accepted by the industry and from now on is a "must" so far as furnace construction and method of rating is concerned. Some excerpts from this standard are published in this issue.

The speaker said one of the tough jobs to be done as quickly as possible is for the industry to standardize on one design method. Today there must be 25 or more methods—we need only one. Manufacturers can help this move to simplification by junking all their own design methods and recommending that one standard method be used.

WPB—Furnaces

Morgan N. Johnston, Plumbing and Heating Division, WPB, reported on developments since the June meeting. He announced amendments to L-22 (amendment came out December 9 and is reported in this issue) permitting use of cast iron for some prohibited furnace parts. He also said that allocations of materials for the first quarter of 1944 should reach manufacturers by the middle of December and said in some cases manufacturers will also get at the same time the allocations for the second, third and fourth quarters. However, these allocations will be subject to later revision, depending on supply.

Steel, reported Mr. Johnston, seems likely to be short for some time, and while there may be allocations of steel for civilian goods, it is too early as yet to count heavily on a civilian goods program much greater than 1943. Effective January 1, all users of less than 150 tons of steel per quarter will have their applications and allocations handled by local WPB offices. Small users needing more than their quotas should apply for additional material through their local WPB—not Washington. Large users (over 150 tons) will continue to apply to Washington.

Mr. Johnston announced CMP-9A permits purchase of complete furnaces on an AA-3 rating, but this ruling has since been denied. A report is in this issue. CMP-9A does, however, practically kill P-84 for steel

sheets—hereafter sheets will be obtained for repair and maintenance under CMP-9A (see report in this issue).

The most important problem to be solved in 1944, said Mr. Johnston, is fair distribution of the 200,000 or more furnaces to be made for replacement. The demand for replacement furnaces, believes WPB, will be tremendous—there won't be that many furnaces, so the manufacturers, jobbers and dealers will have to work out some sort of voluntary distribution system which will insure every owner needing a furnace getting his furnace. If we can't do this voluntarily, WPB will have to take over. Mr. Johnston suggested that each manufacturer determine how many furnaces each jobber got in a normal year and then ship that jobber his fair percentage based on 1944 production. Jobbers, in turn, should do the same thing for dealers. If the industry holds to such quotas, there will probably be furnaces for every needy case.

An informal reception was tendered by several Cincinnati area firms—it was an enjoyable affair.

How to

Raise Salaries

(Continued from page 94)

Stabilization Unit of the Bureau of Internal Revenue that the hours of work of persons comprising the highest salary level for which an adjustment is proposed are necessarily directly related to those of persons receiving time and one-half. In other words, it must be shown that their hours of work vary more or less directly with those of the hourly paid employees.

It should also be noted that time and one-half may be paid to all exempt employees who receive salaries equal to or less than those received by the highest paid "non-exempt" employee. This is obviously necessary since it is the minimum adjustment which will preclude supervisors in such salary brackets from being placed at a disadvantage with respect to "non-exempt" employees in the same brackets.

The above method may be applied either on a departmental or a plant basis. Slight deviations from the above formula may be negotiated with SSU depending upon individual circumstances.

Should you be dissatisfied with the Treasury Department's action in respect to your application but find it necessary to pay for additional hours under an extended work week either proposed or adopted, you may proceed in accordance with the Department's ruling, but under protest thus preserving your right of appeal.

Applications for permission to increase pay because of an extended work week should be filed with the Salary Stabilization Unit of the Bureau of Internal Revenue in the district in which the company's head office is located.

Notice!

The proposed first annual convention of the new Sheet Metal Contractors National Association will not be held in January as planned. The convention will be held late in April. Full details will be announced prior to the meeting.

AMERICAN ARTISAN, January, 1944

169

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NATIONAL WARM AIR HEATING and

AIR CONDITIONING ASSOCIATION

By . . . ALLEN W. WILLIAMS



Research Program In Full Swing

HE following report of the Association's Research Advisory Committee, as presented by F. G. Sedgwick, chairman, to the Association's June, 1933, convention, indicates the duties of that committee and what was going on in the way of furnace research and the industry at that time.

"It is my firm opinion that such improvement as there has been in the warm air furnace industry is due largely to the results of our research activities.

"Ideas we have in profusion. Some of these are right, and some of them are wrong. Some of them may have led us to absolutely erroneous conclusions. Our Research Laboratory at Urbana sifts this mass of ideas, discards those which are fallacious, and retains those which are good. There is no question whatever but that our research activities pay. They pay the industry, they pay you and they pay your customer.

"For the last two heating seasons and one cooling season the efforts of our Research Staff have been turned exclusively to air conditioning. Already a number of important principles have been laid down; enough, in fact, to put the industry solidly on its feet with respect to the fundamental principles behind this business of forced air heating, or better yet, air con-

"If you really are interested and want to know about controls, allowable air velocities, preferred register locations, the value of a plenum chamber above the furnace, the value of casing liners, the effect of gravity flow on a fan system, the humidifying value of a commercial type of air washer, the feasibility of using a forced warm air heating system for summer-time cooling, the effect of awnings on a cooling system, approximately how much it will cost to cool a 7-room house, you can learn these and many other equally valuable things from our research on conditioned air. A full report of progress up to our December meeting will be mailed to the membership within thirty to sixty

"Some have asked, by the way, why we have used ice in our cooling research work. The reason is simply that with ice it is easier to get the information that we want to get on heat absorption. It is a simple matter to weigh ice melting. It is hoped that as soon as certain standards have been definitely established, we may be privileged to continue our research investigation with mechanical cooling equipment.

Recognition by ASHVE

"I can remember years ago when E. B. Langenberg, a former president of our Association, reported that he had been able to secure some recognition for warm air heating by the American Society of Heating and Ventilating Engineers. It was a triumph, for he had tried for years to secure such recognition. I am sure that you are pleased to know how we are now being recognized by the American Society of Heating and Ventilating Engineers.

"The A. S. H. & V. E. has joined with us in our filter research program at the University of Minne-

"Through the A. S. H. & V. E. we last year received a contribution of \$1.500 from the Detroit-Edison Company and \$1,000 from the National Association of Ice Industries, plus the ice required for our summer cooling program. This year we are receiving \$1,000 from the National Association of Ice Industries, plus ice, and \$500 from the Utilities Research Commission, through the A. S. H. & V. E., and the A. S. H. & V. E. has appropriated direct \$250 to our research program at the University of Minnesota.

"Through the A. S. H. & V. E. a group of filter and washer manufacturers has appropriated an additional \$281 for research at the University of Minnesota.

"Representatives of your Research Advisory Committee, with the help of the Research Staff, wrote Chapter 23 of the 1933 Guide of the A. S. H. & V. E. This is the chapter on Mechanical Warm Air Heating and Air Conditioning Systems.

"And these same individuals have submitted copy for the same chapter in the 1934 Guide. Such recognition of this industry is deeply appreciated and is proudly received as a direct tribute to the work at

"Your Association through its research work has obtained the recognition of the foremost authorities of our country.

"There are others who should recognize the value of our work to their industries but who have not as yet done so wholly. I am thinking of the awning manufacturers, whose business is due for a very considerable increase as a result of our investigation of cooling. That industry is already using the results of our research work in its publicity. They should be willing to help pay for that which is of value to them.

"Manufacturers of controls who are not members of our Association should show their appreciation for

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the splendid work that has been done at Urbana on controls.

"Manufacturers of fans and blowers who are not members of our Association should show their appreciation of the money that we are saving them and the profits that we are making for them by joining the Association. All filter manufacturers and washer manufacturers who are not members of our Association should do likewise.

(Note-The leading manufacturers of controls, blowers and filters are now members.)

"The one authentic laboratory for solving housecooling problems is at Urbana and belongs to our Association. Manufacturers of cooling apparatus should see their opportunity.

"I have made reference one or two times to the research work on filters and washers which has been carried on during the past winter at the University of Minnesota under the direction of Professor Rowley, head of the Department of Experimental Engineering at the University of Minnesota.

"The original object of this research was to establish data on the efficiency of filters which would correlate with our work at the University of Illinois, where there was not the equipment to make these tests. As stated before, this research work was financed onethird by the A. S. H. & V. E., one-third by the National Association and one-third by a group of participating filter and washer manufacturers.

"Much has been learned as a result of this research but perhaps the outstanding result has been the development of a filter testing code which can be used by all in the future and which will undoubtedly be presented to the A. S. H. & V. E. for their consideration and, if approved, for their adoption as a standard filter testing code.

"Those filter and washer manufacturers who went into this research were broadminded enough to know that they were sailing on an uncharted sea, helping to pioneer the production of a suitable filter testing code.

"Professor Rowley and our committee have felt, therefore, that it would be most unfair to publish individual results obtained from these tests. Any effort to designate such filter by a general description would result in definitely fixing the filter referred to in the minds of the public, and this we do not care to do as result of this first test.

"It must be understood by all that the dust used in these tests (50 per cent carbon black and 50 per cent Pocahontas coal ash screened through a 200 mesh screen) is not house dust, but probably one of the most difficult dust mixtures that a filter would be called upon to handle-probably much harder for a washer to handle than ordinary house dust.

"Ratings established under this code are not, therefore, to be confused with operating efficiencies in actual service. The dust concentration, the nature of the dust, the relative humidity and many other factors have a definite bearing on operating efficiency in actual use.

"What we have developed is a yardstick by which we hope to establish comparative performance efficiencies—not definite house efficiencies.

"Let it be sufficient for me to say that we tested seven filters, six different types, one with efficiency as low as 5 per cent. The run on this particular filter was not continued beyond four hours because it was evident that the efficiency had decreased below all reasonable standards.

"There were, however, a number of filters whose cleaning efficiencies ran from 60 to 80 and 90 per cent. I have in mind one filter which averaged approximately 80 per cent through the whole of the five hour test. The average starting efficiency of all the filters was approximately 68 per cent.

"You are reminded that our filter testing code specified that the test be continued until the maximum resistance reached .18 inch of water. One filter reached a resistance of .18 inch of water at the end of the first hour. In fact, the starting resistance was .12 inch of water and at the end of five hours the resistance was .40 inch. The average starting resistance of all filters was approximately .10 at 250 feet per minute air velocity.

"In general it is found that filters with high cleaning efficiency will have a high resistance. It was further found that the cleaning efficiency of most filters varies as they fill up with dust.

"There were only two washers tested, and in testing washers we ran into the difficulty of eliminating the moisture carried through into the crucible, so these figures are still subject to correction, but it would roughly appear that the cleaning efficiency of a washer is greatly influenced by the method employed in the elimination of water. A washer without eliminator plates showed a cleaning efficiency of approximately 35 per cent. With eliminators, efficiency ran up to as high as 57 per cent with ordinary eliminators and 80 per cent with close-mesh eliminators.

"It is also indicated, although, of course, not conclusively, that the cleaning efficiency of a washer has some relation to the speed of the air going through the washer. One of the washers was tested at low velocity and high velocity and the test seemed to indicate that the cleaning efficiency was greater at the higher velocity. This, of course, does not prove that still higher velocity would not again reverse the

"It seems fair to assume that efficiency in a washer depends greatly upon the method of elimination, but with increasing resistance as the eliminating device becomes so complicated as to secure maximum cleaning

'The chief benefit from this research, aside from the establishment of the code, will undoubtedly be that some filter and washer manufacturers will know definitely where they stand; some will continue to make their products as they are and some may want to make some changes. The ultimate result may be better filters for furnace manufacturers, furnace dealers and the public.

"A more detailed report on the results of these filter tests will be presented to the A. S. H. & V. E. possibly at the June meeting this year and the results may be published immediately following the meeting or possibly in some future issue of the journal of the A. S. H. & V. E.

"I have tried in this report to give you a general idea of what is going on in the Research Department of the National Warm Air Heating Association, My only object is to whet your appetite a bit and bring the whole background of our research activity into a

"Your research activity has carried on through the depression period with only a very little less activity (Continued on page 202)

AMERICAN ARTISAN, January, 1944

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Indiana

Frank G. Sink, President of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, invites sheet metal workers to come to Indianapolis on February 1, prepared for a day bristling with new ideas, up-to-theminute suggestions, a real glimpse into the future, and

he believes, coming in the nick of time.

"Everything may be going along fine right now, but what steps are you taking to be able to meet stiff competition such as the Post-War period will hold? Perhaps it is O. K. to go out and blow off steam once in a while, but what the Indiana sheet metal and furnace contractor needs right now is a one-day strictly business convention, and that is just what is being made available to you."

Every minute will be valuable from 9 o'clock in the morning to 4:30 in the afternoon with time out only for a very enjoyable informal luncheon at which time you can

shake hands with your competitor.

This convention will be worth more than a month's profit to you, according to President Sink. Bring a notebook and a pencil, and your questions—they will be properly answered. Thus, prepare to stay in business profitably.

Illinois

At the Board of Directors Meeting of the Sheet Metal Contractors Association of Illinois, held at the Jefferson Hotel, Peoria, on December 4, the following officers and Directors were present:

Edward M. Pluth, president, Lincoln.
C. L. Lauerman, vice-president, Galesburg.
Frank Eynatten, treasurer, Peoria.
W. R. Shaw, secretary, Jacksonville.
George F. Bushman, director, Aurora.
Joe J. Walters, director, Ottawa.

Joe J. Walters of Ottawa reported on the meeting of the National Directors of the new National association in Chicago on November 15. He stated it would benefit all the sheet metal men to attend the first National convention to be held in Chicago early in 1944.

The reports of the secretary and the treasurer were

read and accepted.

A motion was made and seconded that By-Laws be changed to read: Article 1, Section 1: The officers of this association shall consist of president, vice-president, secretary and treasurer. The directors shall consist of four sheet metal contractors and two auxiliary members: total of six directors. Motion made and seconded that President Ed. M. Pluth have By-Laws printed.

The association was invited to hold its 1944 convention in Peoria by Frank Eynatten, State Treasurer. The date has been chosen and arrangements made with the Jefferson Hotel, Peoria, for April 12th and 13th, 1944.

The next directors meeting will be held the last of January, when final plans for the convention will be made.

If you have any problems that you would like the help of the association in solving, please write, and the officers will do all in their power to assist you.

W. R. Shaw, State Secretary.

Wisconsin

The tentative program of the Sheet Metal Contractors' Association of Wisconsin begins on Sunday, February 6, with a Board of Directors' and Convention Committee meeting at 3 p. m. in Room B, Fifth Floor, Schroeder Hotel, Milwaukee.

On Monday, after registration and distribution of badges in the 5th floor foyer, there will be an announcement by the president, and appointment of committees.

At 2 p. m., President Paul Krueger will open the convention, followed by a talk on "Your Income Tax Problems"-individuals and corporations-by representatives of the Internal Revenue Office of Milwaukee.

The United States Steel Supply Company—C. Gallauer, Jr., District Manager-will show the latest movie film on steel-"Steel, Man's Servant."

On Tuesday at 9:30 a. m., in the first floor banquet room, there will be a business session for members only.

In the afternoon at 2 p. m. J. D. Wilder, Editor, American Artisan, will talk on "Heating Problems During Post War Periods." Frances Lamb of Madison, Wisconsin, will talk on "Post War Building Programs."

A Committee of the Manufacturers and Jobbers will operate the Hospitality Room for recreation and good fellowship during the convention-Robert Oelstrom, Chair-

man, M. L. Lavorgna and Elmer Radmer,

Visiting ladies are cordially invited to attend the convention, and will be entertained by the Milwaukee Ladies' Committee—Mrs. T. Tonnsen, Chairman. Assembly and rest room for the ladies in the English Room, Fifth Floor.

A Stag Card Party with prizes, refreshments and lunch will be held on Monday evening—W. D. Marth, Chairman. Ladies' Card party with prizes in the English Room on the

same evening—Mrs. W. D. Marth, Chairman.
On Tuesday evening, February 8, there will be a dinner at 7 p. m., followed by dancing in the Crystal Ball Room

-Fifth Floor, and prizes for the ladies.

The convention committee includes T. Tonnsen, Chairman, Milwaukee; Michael Henn, Milwaukee; C. G. Tolg, Waukesha; G. Ritonia, Milwaukee; Milton Roesler, Milwaukee; J. F. Klump, St. Francis; Paul L. Biersach, Secretary, Milwaukee; and President Paul Krueger, Madison. Paul L. Biersach, State Secretary.

New York

The New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association in 1940 believed that the rates for compensation insurance were unreasonably high and formed, with the assistance of Laverack & Haines, Inc., of Buffalo, New York, an insurance group within the State Insurance Fund for the benefit of its members.

This Group has now completed its first two years and the results have more than justified the Association in

taking this step.

In its first year the Group saved its members 241/2 per cent based on manual rates, and in the second year ending April 1, 1943, saved them 32 per cent. In addition, the Group has built up a substantial surplus.

Compensation insurance cost, as you have undoubtedly realized, constitutes a goodly portion of your operating expense. A saving of \$32.00 out of every \$100.00 of prem-

ium, therefore, becomes a pretty large item.

If you are not a member of this Association we would point out that this is only one of the many advantages gained by membership. Why not join this Association and on your next insurance anniversary date enjoy the privilege of becoming a member of this money saving insurance group?

The following is the second annual accounting in brief. (Continued on page 174)

tough problem:

How to get 33,000,000 B.t.u... need 68°-72° for personnel... with an awkward fuel situation

The pressing need of converting existing buildings to their best war-time uses has presented many difficult heating problems. Example: A rambling structure that had been designed as a freight warehouse was requisitioned for use as an Ordnance Depot.

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The partitioning of areas for office workers

greatly increased the number of points to which heat must be delivered. Total heat requirements were '33,000,000 B.t.u. per hour. Coal was the only available fuel. A central boiler plant and distributing system would have required a prohibitive amount of critical metals. Its installation would have consumed precious time.



AMERICAN ARTISAN, January, 1944

173

Association Activities

A more complete report of the Group experience is avail-

If you are already a member of this Association, you are entitled to the benefits to be obtained by joining this in-

S	urance group.	
	Premium	\$70,477.73
	Interest Earnings	131.27
	Total Income	\$70,609.00
	Loss\$18,341.00	
	Expense including reinsurance, but excluding	
	management cost 16,560.30	
		34,901.30
	Initial Premium (15% less than Stock and Mutual	
	Rates) is	70,477.73
	Premium at Stock and Mutual Rates	82,915.20
	The following table shows costs and savings:	
	Premium at Stock & Mutual Rates\$82,915.20)
	Actual Premium 70,477.73	
	Initial Gross Saving\$12,437.47	
	Earned Interest	
	Total Gross Initial Saving\$12,568.74	
	Less Management Cost 7,047.77	
	Initial Saving \$ 5,520.97	- 6.65%
	Dividend 21,143.35	
	Cash Saving	-32.15%
	Increase in Group Members surplus 15,412.42	
	Total Saving\$42,076.71	-50.73%

When the surplus is built up to a point where all the dividend is in cash, the group will not be open to new membership, in fairness to those whose initiative and foresight made possible the present enjoyable dividends.

1944 Convention

At the last regular Board of Directors Meeting in Syracuse, it was decided to hold our Annual Convention in Albany, New York at the Ten Eyck Hotel on March 29-30. The convention as usual will be crammed full of interesting topics for those who value two days away from business worries as reason enough to come to Albany to learn new and better ways of business and meet their fellow associate in the industry. Charles Joyce of Albany is the General Chairman-"Nuff Sed."

Draft Deferment

No doubt you have men in the draft age and want to keep them to help hold the line against that ever growing manpower shortage. Here's how and the only way-IMMEDIATELY, upon the employee receiving his classification 1-A, contact his local service board and ask deferment under 42-A of the draft law and prove your case that he is indispensable to the industry. Note that your employee must notify you at once, upon receiving his 1-Aif he waits until he is called for induction there is no chance at all of holding him. This is the advice of Draft Headquarters in Washington.

Sheet Metal Contractors' National Association, Inc.-

Join now! If you want to be a Charter Member. The Charter will close soon. Special to local Secretariescontact all local members at once for National Membership. New York State started this National and we need your members.

Clarence J. Meyer, State Secretary.

Florida

The officers of The Roofing & Sheet Metal Contractors Association of Florida send Christmas Greetings and a wish for a Happy New Year to all members.

Letters received since the November Florida Roofer indicate that a meeting in May would be well attended.

Frank Tack thinks the association should have a convention or "War Conference" this spring and suggests that it

be held in Tampa with the shops of Tampa, St. Petersburg and Clearwater cooperating to put the meeting across.

Mack Fillingham says he is heartily in favor of a convention, but doubts if Jacksonville could handle the convention this year. He expects a fair representation wherever the convention is held.

Ellard Kohn has submitted the open letter to the Miami Beach Convention Bureau and the City Convention Director has extended an invitation to the association to meet in Miami Beach.

E. H. Hale advises that he is ready to meet with the committee at any time to discuss plans for the 1944 convention.

J. H. Van Hoy, Bird and Son representative, has expressed his continued interest in the association by mailing his check for 1944 dues.

Mrs. R. E. Moorhead writes for Bob-just out of the hospital after an emergency appendectomy-that Lake Wales is again on the map for the convention, if so chosen.

E. O. Hathaway of Tennessee Coal, Iron and Railroad Company favors Tampa for a convention in May and has offered to contact the shops there to determine if the West Coast shops will arrange for the best of all conventions.

Bill Palmer writes: "About all of the big war work is over; and each year we skip a convention just means we slip in membership. So let's all, new and old members, start work to have the convention in April or May.

> L. A. Burgess, Secy., 915 N. Poinsettia Ave., West Palm Beach.

Milwaukee

At our annual meeting of the Milwaukee Sheet Metal Contractors' Association, Inc., held December 7, at the Hotel Schroeder in Milwaukee, election was held for the Board of Directors and the Officers to serve for the year

Following is the result of this election: Board of Directors: Frank Kramer, H. V. Mundigler, A. R. Podolske, Louis Stefanik, Walter Marth, E. A. Winkler, Howard Benning, Harry Yampol and Milton Roessler. The Board of Directors elected the following officers to

serve for 1944:

President, Arthur R. Podolske.
Vice President, Adolph E. Winkler.
Secretary, Howard Benning.
Treasurer, Frank Kramer.
Sergeant-at-Arms, Louis Stefanik. Executive Secretary, Paul L. Biersach.

Paul L. Biersach, Secretary.

Coming Conventions

1944

- Feb. 1 Sheet Metal and Warm Air Htg. Contr. Assn. of Indiana. Joint Meeting with Indiana Furmets. Hotel Antlers, Indianapolis. Frank G. Sink, Pres., 621 E. Ohio St., Indianapolis.
- Feb. 7-8--Sheet Metal Contractors Association of Wisconsin, Inc., 30th Annual. Hotel Schroeder, Paul L. Biersach, Secretary, Schroeder. 225 E. Michigan St., Milwaukee.

Mar. 7-9-Michigan Sheet Metal, Roofing, Heating & Air Conditioning Contractors Convention, Occidental Hotel, Muskegon. N. J. Biddle, Secretary, 7310 Woodward Ave., Detroit 2.

Mar. 29-30—New York State Sheet Metal, Roofing & Air Conditioning Contractors' Assn., Inc. Annual Convention. Albany, Ten Eyck Hotel. Clarence J. Meyer, State

Secretary.
Apr. 12-13—Sheet Metal Contractors Association of Illinois. Annual. Annual. Jefferson Hotel, Treasurer, Peoria.

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FURNACE
MANUFACTURERS
TO TEST THE
VITROLINER
FLUE NOW!

The Vitroliner Flue is now listed by Underwriters Laboratories for all fuels.



Photo of Testing the Vitroliner Flue in Underwriters Laboratories

Complete and exhaustive tests for safety were made under every possible condition. Temperatures were recorded at all points along the flue. The Vitroliner Flue was found safe in every respect.

A BETTER FLUE FOR POST-WAR FURNACES

The Vitroliner Flue replaces the standard masonry chimney and guarantees peak performance for all types of Post-War Furnaces.

This superior flue is designed to withstand and carry away all products of combustion. Strong acids, gases and condensation have no harmful effect on the durable vitreous enameled surface of Vitroliner. Test Vitroliner—you'll get double the draft of a masonry chimney of the same height and cross section area. You'll find Vitroliner absolutely safe, built with many safety features incorporated.

Vitroliner requires no foundation of any kind, can be installed in any part of the house, suspended from ceiling or built in wall structure. The cost of Vitroliner for post-war homes will be less than half the cost of masonry construction, with practically no maintenance cost. Can be completely installed in one hour, and has extremely long life.

In addition, new heat saving features will be incorporated in the post-war Vitroliner Flue—watch for announcement. Furnace manufacturers will benefit materially by testing Vitroliner today for tomorrow's business. Vitroliner represents 14 years of engineering development and research.

Contractors: If you have Government Specifications calling for suspended chimneys, wire us for prices. Vitroliner Type "E"

Flue acceptable to all Government Agencies

Write for free circular today

CONDENSATION ENGINEERING CORPORATION 2515 ARCHER AVENUE CHICAGO, ILLINOIS

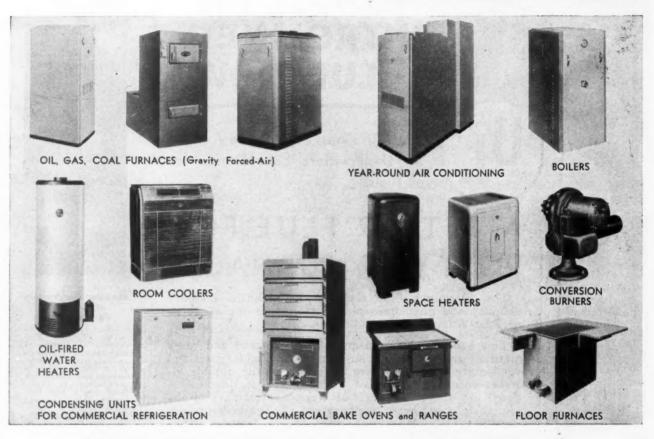


Showing Construction of Type "E" Vitroliner Flue

The Vitroliner Flue consists of lengths of acid-resisting vitreous enamel coated heavy-gauge metal pipe with welded seams, and bell and completely covers lated with a high temperature prefabricated Fyrex Asbestos Insulation, 1 in. thick. The vitreous enameled outer casing of metal extends the length of the Flue and apigot joints, insuthe insulation.

At the present time Vitroliner is used extensively in Defense Housing, over 20,000 now in use. It fully meets the new and revised Government specifications for suspended chimneys.

This MAJOR LINE OF EQUIPMENT BY VIKING



MEETS EVERY HEATING AND COOLING NEED . . .

One of the biggest and best known plants in the heating and air-conditioning industry is right now all tooled up and merely waiting for your orders. Equipment for permitted fuels is available on orders acceptably rated under current government regulations. The Viking line has been in production continuously throughout these war years, supplying war projects and the armed services with the finest heating and allied equipment America can build.

BUILD YOUR SALES WITH VIKING— THE LINE THAT'S READY TO SERVE YOU!

Think of all the unfilled orders accumulated right now in your community for the items illustrated—then think of the hundreds of additional orders that will "break" as peace approaches. Get actively into this great market now. Go after today's orders on which priority is available—and make ready for all the others which await the day of unrestricted selling.

Let us show you the products we will have available for you, and proof of our ample capacity to keep supplying them. Only then will you realize just how big this opportunity is for you.



In all this conversation about Postwar Planning, some in the trade are losing sight of the fact that equipment is being sold every day.

Throughout this period of shortages of critical materials, we have been able continuously to supply Viking equipment to both government and our trade. Dealers who submit orders with acceptable priorities are receiving the needed material with reasonable promptness. Sooner than most of the trade realizes, our civilian production will increase.

LOOK TO YOUR VIKING DISTRIBUTOR!

In these difficult times add his weight to your efforts. Now and postwar he is your complete supplier — maintains showrooms — provides engineering assistance and financing—and gets quick action for you from manufacturers.

We believe our policy of supplying Viking merchandise *only* through fully qualified distributors best insures complete satisfaction to everyone, including the user who pays all of us.

By this policy, a Viking dealer has a large, nearby "pool" of Viking units, parts and accessory material at his disposal without wasteful capital investment on his part. Under this arrangement a Viking

dealer is enabled to put *full* emphasis on his most profitable functions — SALES, INSTALLATION and SERVICE.

MAIL COUPON FOR VIKING CATALOG

If you are looking for the ideal source of supply—the one that can give you practically every type of equipment in the heating and allied fields—get our proposition and catalog today. Mail coupon or write.

HEATING · COOLING THE VIKING MFG. CORPORATION

THE	VIKI	NG	MF	G. C	ORPOR	ATION
Main	and	Fou	rth	Sts.,	Dayton	2, Ohio

Please send your catalog and proposal.

Your Name

Firm Name

Address

Mark here whether dealer □ or jobber □



STARTING JANUARY 18TH

STARTING January 18th, it's up to you to lead the men and women working in your plant to do themselves proud by helping to put over the 4th War Loan.

Your Government picks you for this job because you are better fitted than anyone else to know what your employees can and should do—and you're their natural leader. This time, your Government asks your plant to meet a definite quota—and to break it, plenty!

If your plant quota has not yet been set, get in touch now with your State Chairman of the War Finance Committee.

To meet your plant quota, will mean that you will have to hold your present Pay-Roll Deduction Plan payments at their peak figure—and then get at least an average of one EXTRA \$100 bond from every worker!

That's where your leadership comes in-and the lead-

ership of every one of your associates, from plant superintendent to foreman! It's your job to see that your fellow workers are sold the finest investment in the world. To see that they buy their share of tomorrow—of Victory!

That won't prove difficult, if you organize for it. Set up your own campaign right now—and don't aim for anything less than a 100% record in those extra \$100 bonds!

And here's one last thought. Forget you ever heard of "10%" as a measure of a reasonable investment in War Bonds under the Pay-Roll Deduction Plan. Today, thousands of families that formerly depended upon a single wage earner now enjoy the earnings of several. In such cases, 10% or 15% represents but a paltry fraction of an investment which should reach 25%, 50%, or more!

Now then-Up and At Them!

Keep Backing the Attack!—WITH WAR BONDS

This space contributed to Victory by AMERICAN ARTISAN.

This advertisement prepared under the auspices of the United States Treasury Department and the War Advertising Council

the soci

Here's Your Directory of Quality Sodering Supplies

The New Wonder Soder That Needs No Priority

You can end your soder worries right now with Allen's Siloy Soder, the new low tincontent wonder soder. It works like magic with most common metals . . . in many cases even better than high tin-content soders. Recent prolonged tests prove an amazingly high strength on joints sodered with Siloy. That's a fact worth remembering. Samples of this outstanding "No Priority" product are yours for the asking.



(Item 1) OF

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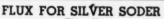


SILVER SODER

Wire form for all around work. Excellent tensile strength, high vibration and corrosion resistance. Gives rigid, good color toint.

color joint.

Ribbon form same specifications as wire. (For band saw work.) Wire Form



(Item 3)

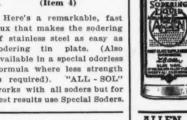
Provides quick, smooth flow giving deep sound silver soder penetration on most metals including stainless steel.



ALLEN "ALL-SOL" STAINLESS STEEL SODERING FLUX

(Item 4)

flux that makes the sodering of stainless steel as easy as sodering tin plate. (Also available in a special odorless formula where less strength is required). "ALL - SOL" works with all soders but for best results use Special Soders.





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ALLEN SODERING OIL

(Item 5)

A highly technical, concentrated sodering compound officially endorsed by the National Underwriters.

Causes neither verdigris nor corrosion. Gets into the tiniest crevice and takes the soder along with it. Makes perfect electrical and me-chanical joints. For hand or machine sodering. Excel-lent for sweat sodering cop-per pipe joints.

ALLEN SODERING STICKS

(Item 6)



-Underwriters "Official Approval Listing"-ALLEN STANDARD FORMULA

An economical, rapid flux. Just a touch to the hot metal does the work. Fuses the soder rapidly without fuss, muss, or after-corrosion. "SAMSON" Formula—Second to none save the ALLEN.



ALLEN Neutral Rosin Fluid Flux

(Item 7)

This is a flux of absolute safety for electric motors, telephone, radio, commutators, instrument work, fine wires, etc. This flux is so safe you can spill the flux on the work allowing it to remain forever with no corrosion hazard to the finest wire or metals. Allen Neutral Rosin Fluid Flux is absolutely neutral and moisture free and absolutely non-conductive to electrical current.



ALLEN SODERING LIQUID

Standard Formula. For all-a-round work, for all metals save aluminum and stainless steel.

17,000 pounds to the square inch with no gumming, fumes, or corrosion. Double strength, non-evaporating. Works 1 i ke Lightning. Adaptable to hand, or machine sodering. Excellent for tinning the sodering copper. 17,000 pounds to the square

ALLEN EZY-FLO Torch Formula Sodering Paste

(Item 9)



A special sodering paste for torch and "sweat joint" sodering. Also works well with the sodering iron. Comes in same sizes and at same prices as "Stand-ard Formula."

ALLEN SODERING PASTE



Joints, Saves time. Triples strength of the soder, Makes soder self-fluxing. Official National Under-writers Laboratory approved listing.



ALLEN SODERING SALTS

An all around flux in convenient powder form; just add water 3 to 5 times according to metal to be sodered. Soders all metals but aluminum. Takes a quick bite and makes the soder hold on. Nonacid. Comes packed in metal or glass as preferred.



6702 Bryn Mawr Ave. CHICAGO 31, ILL.



ALLEN Technical Research Division

or the testing, development and perfection of Allen products and to help solve our customers' technical problems. If you have a sodering, tinning or related problem we shall be glad to co-operate. There is no charge for this service.

The following Allen Technical Bulletins are available without charge.

A) Strength of Soder (Resistance to vibration).

B) Breaking strength of Wire Soder (Shows tin-lead proportions).

C) Length of one pound of Wire Soder in various sizes and alloys.

D) How to Soder Stainless Steel Pipe and Fittings.

FREE	
OFFER	N.O.W
T	115

L. B. ALLEN CO., INC. 6702 Bryn Mawr Avenue Chicago 31, Illinois

Send us FREE Allen Technical Bulletins listed above. Check those desired:

A — B — C — D Without obligation send us further information on the product items checked here: Nos. 1-2-3-4-5-6 -7-8-9-10-11. Put us on the complimentary mailing list of "Quips and Tips", the little Allen Monthly House Organ:

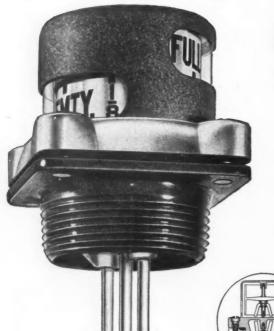
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Jobber								*									

ROCHESTER MFG. CO., INC. ROCHESTER 10, N. Y.

PRESSURE GAUGES

LIQUID LEVEL INDICATORS **AMMETERS**

INDUSTRIAL **THERMOMETERS**



LEAKPROOF UNDER PRESSURE

No Oil or Fume Seepage . No Fire or Health Hazard With Rochester Magnetic Fuel Oil Gauge

Make certain of customer's satisfaction by installing Rochester "UNIVERSAL" Fuel Oil Tank Gauge. Guaranteed leakproof because no shaft comes up through gauge head into dial chamber. Cutaway view shows how lower U shaped magnet turning in response to movement of float arm, controls upper magnet affixed to dial. Hairline accuracy. Easy to install, no servicing. Approaching million mark of delighted users. Get your share of this growing demand from now on.

LISTED BY UNDERWRITERS

Illustrated: Model U-4, Bolted head for installing at either end or center of vertical or horizontal fuel oil tank regardless of oil level. Either 11/2" or 2" pipe thread.

> Send for large illustrated folder fully explaining magnetic principle.



ROCHESTER DIAL THERMOMETERS

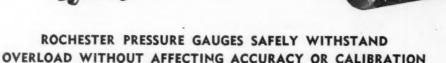
Extremely durable. 2 and 3 inch dials. 3" stem. Several temperature ranges down to -90°F. Quick response. 200 to 1000 range shown here ideal for testing stack

or exhaust gas temperatures. Test model medium range, reads directly in Fahrenheit and Centigrade.

SEND FOR CATALOG

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For water, air or oil. Various pressure ranges. Heavy steel case. Forged brass stem and diaphragm retainer. Heavy duty movement plates of phosphor bronze, monel, nickel silver and stainless steel for long service. Tested to 400 pounds.

ASK FOR CATALOG ON PRESSURE GAUGES



AN INDUSTRY LEADER'S POSTWAR OBJECTIVES



OIL-O-MATIC PRODUCTS

BETTER living has first call on the billions of dollars that millions of Americans are now investing in War Bonds. Better living means better homes . . . better heating . . . better cooling . . . better air conditioning. All are prominent in postwar living plans.

Oil-O-Matic will be ready! Out of Williams laboratories will come the finest line of better living products ever to bear the Oil-O-Matic name. These postwar Oil-O-Matic products will be soundly engineered, precision-built.

Better living will mean better business for Oil-O-Matic dealers. Every Oil-O-Matic dealer can look forward to the leader's share in his own postwar market.



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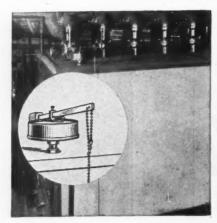
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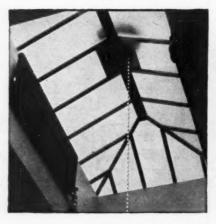
, 1944

WILLIAMS OIL-O-MATIC HEATING CORPORATION BLOOMINGTON, ILLINOIS

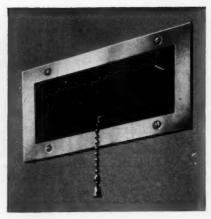
BEAD CHAIN - KINKLESS - ADJUSTABLE



Furnace damper regulator chain



Skylight pull chain



Ventilation pull chain

Kinkless BEAD CHAIN is attractive and durable. With suitable attachments its length can easily be adjusted. It is made in many metals and finishes. Uses—Ventilator and Skylight Pull Chains... Boiler and Furnace Damper Regulator Chains... Warm Air Register Chains... Remote Control Chains.

BEAD CHAIN AVAILABLE IN SPOOLS AND SPECIAL LENGTHS

BEAD CHAIN for trade use is sold in spools of 250 ft. of No. 13 and 500 ft. of No. 10. A and B type couplings ((C) and (F) below) and other terminals and fittings are packed in bulk. Special lengths of BEAD CHAIN supplied on order. Complete assemblies with terminals if desired.

STANDARD SIZES OF BEAD CHAIN

Nos. 10 and 13 most generally used for heating and air conditioning installations.



No. 13-1/4" dia.



No. 10-16" dia.



BEAD CHAIN ATTACHMENTS



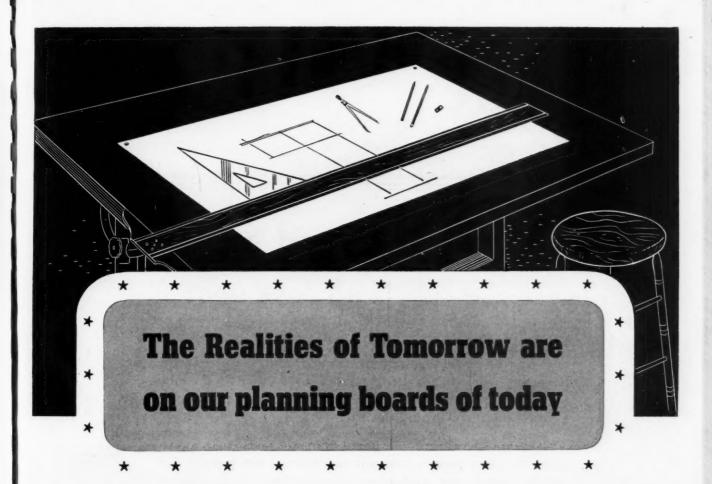
These parts are made in sizes and metals corresponding to chains. Order by chain number. (A) Detachable pendant. (B) Non-detachable pendant. (C)—

A-type coupling. (D) Cord and chain connector. (E) Plastic pendant. (F) B-type coupling. (G) Coupling hook. (H) Ring pendant.



BEAD CHAIN is made by the Multi-Swage Process . . . the most economical method of producing small metal parts of close tolerances without waste.

THE BEAD CHAIN MANUFACTURING COMPANY
105 MOUNTAIN GROVE ST., BRIDGEPORT 5, CONN.



UR JOB in this war, we think, is being handled efficiently and effectively. Over 52 years of manufacturing experience taught us how to quickly convert a large part of our production to war use. As long as war is waged we expect to continue. We believe that this is what our loyal customers and friends would have us do.

But at the same time we recognize the

obligation we have to Niagara dealers in looking toward the future, so that when peace returns and we can again supply all types of Niagara gravity and forced air heating equipment, we will both be ready.

When that day comes, the resumption of full line production will be no difficult problem to Niagara. In preparation for that time, many realities in modernized Niagara furnaces are on our planning boards today.

THE FOREST CITY FOUNDRIES COMPANY

2500 West 27th Street, Cleveland, Ohio

NIAGARA

GRAVITY AND FORCED AIR FURNACES

y, 1944



When the Need arose ... all last year

INTERNATIONAL was called on to do war contract work—and was called on to supply war housing units to keep the homes of war workers properly heated, so that they could turn out the equipment and materials necessary to aid our fighting men in winning the Victory.

This meant sacrifice on our part—it meant sacrifice in many cases on your part—it meant sacrifice on the part of the public—since our production of units for civilian replacement was necessarily curtailed.

However, it was and still is a very definite part of our overall war effort and we are sure that you, our customers, are willing to stand your share alongside us.

Since 1842, INTERNATIONAL and its predecessors have been called on to take some part in each of our victorious wars — either in personnel or in production of war-needed equipment. We shall continue until there is no longer the need for our participation.

Meantime, every effort will be made to produce heating equipment for you and your customers' need.





INTERNATIONAL HEATER COMPANY

WESTERN OFFICE AND WAREHOUSE • 1933 WENTWORTH AVE., CHICAGO, ILL. NEW ENGLAND OFFICE AND WAREHOUSE • 110 CHESTNUT ST., NASHUA, N. H.



SECONDARY ALUMINUM TAKES TO THE AIR!

One device that plays a mighty important part in getting our Fortresses there and back—safely, is the inconspicuous but deadly little "belly bubble" or power-controlled lower gun turret on the underside of our bombing planes.

Precision-built, it is essential that its constituent metals be above reproach in quality. That is why we're proud that Federated aluminum is contributing to the fabrication of these little Axis

eradicators—and also for parts of guns, tanks, planes and many other vital units of our war machine.

Today, thanks to meticulous control plus advances in metallurgical processes, secondary aluminum ingot is comparable in quality to the best of aluminum. Federated aluminum will meet your requirements.

Consulting service available through your nearest Federated office.

PRODUCTS PRODUCED BY FEDERATED METALS

ALUMINUM
BRASS
BRONZE
DIE CAST ALLOYS
SOLDER
BABBITT
TYPE METAL
ZINC DUST

All of these in all commercial forms—Special Alloys to your specifications.



Federated

METALS DIVISION

AMERICAN SMELTING and REFINING COMPANY

120 BEGADWAY, NEW YORK (5) N. Y.

Nation-wide service with offices in principal cities

1944

Bound to be better-because we've devoted OVER 30 YEARS TO PERFECTING

the famous

FROS-FAIRE

Thirty-two years is a long time in cooler history—but it has been that long since Andrew Palmer of Phoenix, made his first cooler. Since then, the Palmer Corporation has been continuously manufacturing and improving air-conditioning equipment, in the testing-ground of cooling systems... the Arizona desert.

Today, Palmer's modern Frost-T-Aire brings complete satisfaction to its users. For more customers and more profits, consider Fros-T-Aire—made by America's oldest recognized maker!

ALL TYPES IMMEDIATELY AVAILABLE

All types, ranging in size from 2500 CFM to the largest made, 30,000 CFM, can be delivered promptly when order is accompanied by WPB-approved form No. 2449. Consult your local WPB office.





A—Horizontal B—Upblast

C—Downblast D—Fan Model

WRITE FOR FREE CATALOG, PRICES



Dalmer

MANUFACTURING CORP.

PHOENIX, ARIZONA

In the "air-conditioned capitol of America"

ARMINI THE RESIDENCE OF THE PARTY OF THE PAR

TIE TO A NAME WITH A FUTURE



CONCO DIVISION OF H. D. CONKEY & COMPANY, MENDOTA, ILL.

AMERICAN ARTISAN, January, 1944

NO POSTWAR PLANS NEEDED!

.. when it comes to firepot repairs



Hundreds of furnace men
say: "IT'S FIRELINE FOR
ME FROM NOW ON!"



★ WINTER DOESN'T CRAMP YOUR STYLE!

Fireline goes in fast; doesn't seriously interrupt heating; meets the emergencies right through the winter. Get this profitable business —

KEEP A DRUM ON THE TRUCK!



A LOT of furnace men recognized Fireline years ago as the best, quickest, and most profitable way to repair cracked and burned-out firepots. But there were always the skeptics—the fellows who clung to the "tear-'em-down-and-put-in-new-castings" way.

It took a war and a repair parts shortage to convince these fellows that they can do a bang-up job without castings and make more money in terms of percentage.

Of course, it's true that right now Fireline has some advantages it didn't have in normal times: You can get it promptly from your jobber without permits and priorities, and you can do more jobs with less labor. But this is of only passing importance; the real reasons for using Fireline are these:

- (1) It has proved to be the *ideal* way to restore cracked firepots. It seals all cracks and checks—provides a modern, refractory lining that stands up; assures a hotter fire and a real fuel saving.
- (2) It makes every furnace owner a prospect—not only repairs the cracked firepots; also used to protect the firepots that are still in good condition.
- (3) It does the job in a fraction of the time required to dismantle a furnace and replace firepot castings. Since only a brief shut-down is necessary, jobs can be installed throughout the winter.

These are not just wartime advantages. They are postwar advantages, too, and you'll agree with this when you get on to Fireline. Write today for bulletins and name of nearest jobber.

FIRELINE STOVE & FURNACE LINING CO. 1816 KINGSBURY ST. (Dept. A), CHICAGO 14, ILLINOIS

FIRELINE

STOVE & FURNACE LINING

For Bigger PROFITS Choose the NEW IMPROVED 1944

Easy to sell . Easy to install!



You profit by our active and effective sales co-operation, competent engineering advice and prompt shipments.



Our fixed policy of close, helpful co-operation with present VICTOR Dealers makes money for them-and it will make money for you.



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You owe it to yourself to investigate this money-making line. Write today.



Perfectly fitted VICTOR Furnaces make quick, labor-saving installations. Less labor cost-more profit.



To your own knowledge of heating, ADD our 53 years of successful experience in the furnace business. We work together for your profit.





VICTOR FURNACE

-to meet your particular requirements nes & Si as to type capacity and price range.

Profitable

-because FIN RADIATION gives your customer extra value. quicker heat, thrifty fuel economy. More profit for you through easier sales.



IS THE TIME TO GET READY FOR AFTER-THE-WAR **PROFITS**

HALL-NEAL FURNACE CO.

INDIANAPOLIS, INDIANA



A FAMOUS NAME IN FURNACES

Yesterday-Today-and Tomorrow!



Moistair Blended Iron Gravity Furnace. Superior features—low in cost.

EVER since 1871, Round Oak has held an enviable reputation for quality furnaces and heating equipment providing honest values. Although styles have changed and products have improved, the same rigid standards of craftsmanship have not varied. Today, Round Oak products are in use the world over—serving faithfully and efficiently—giving every user full value. Tomorrow, they will be even finer—famous for quality and backed by 73 years of know-how.

If you want to cash in on the tremendous post-war sales opportunities, tie up with Round Oak and take advantage of its broad, salable line—its profitable dealer franchise. Then you'll be equipped to cover the entire warm air furnace field—in both new construction and replacement markets. Then you can be sure of quality products and customer satisfaction. And you'll be backed by Round Oak's long experience; its friendly, helpful sales policies. There is no substitute for that! Write for facts today.

ROUND OAK CO.

DOWAGIAC, MICHIGAN

4 THINGS YOU CAN DO TODAY TO GET POST-WAR BUSINESS

Now... active, aggressive dealers can prepare for the post-war selling period, not with words only, but with some inexpensive timesaving action. This advertisement is one of a series that will discuss some of the things you can do now...today to help prepare yourself for the coming of peace. It represents Viking's attempt to help you get your share of the immense demand that will be there waiting.

From time to time Viking will issue free helps to interested dealers who are preparing now for the peace. If you would like to have these valuable free helps as they are published, please send us your name now and we will see that you get them.

KEEP IN TOUCH WITH SUPPLIERS



Merchandise will not be available in quantity all at once. In all likelihood small amounts only will be available at first, and if you want to take advantage of the demand before your competitors do, start getting in touch with suppliers as soon as possible. Let them know what your anticipated demands may be. Viking is setting up a contact

system that will supply interested dealers with literature and new product information in advance of availability of merchandise. Send us your name and we will see that you get the selling information and ammunition you need as soon as it is issued.

USE AVAILABLE LITERATURE NOW



Wherever possible use literature now to help pre-sell your customers for after the war. When you make a service call or contact any prospect or customer, leave literature. Point out that the merchandise is not available now, but that you are leaving the literature so that they can familiarize themselves with the advantages of a forced air heating

system, of summer cooling, of a proper humidifying system. Viking will be happy to send you all the necessary literature as it comes off the press. Just send us your name.

DEVELOP AND WORK A PROSPECT LIST



Assemble from files and other sources the names of customers and prospects, send friendly little multigraphed notes on your letterhead to them. Tell them you know how much they want to make necessary home repairs, and how you are anxious to help them. Suggest they begin to plan for these repairs, tell them to earmark a part of their

savings, offer to come in and discuss the changes with them. Viking is now preparing several such friendly little notes and will be glad to supply them at no charge. Have them duplicated on your own letterheads and mailed by your office girl or a letter shop.

GET TOGETHER WITH YOUR JOBBER



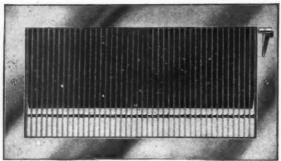
Your jobber is your good business friend. It pays to be on good terms with him. When merchandise becomes available, he'll be the first to get it, of course. Find out his ideas on when it may begin to come through for him, let him know what you think your needs may be, keep in touch with him regularly to make sure you're right

there when he has blower, fan and humidifying equipment to sell. As a part of its service to you, Viking will make known to all dealers on its mailing lists any pertinent changes in the merchandise situation as they occur.

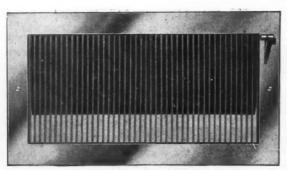


AIR CONDITIONING CORPORATION . 5600 Walworth Avenue . Cleveland 2. Ohio

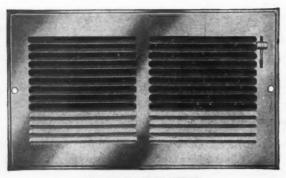
AIRLINE . . . FLEXAIR . . . PLIAVANE



AIRLINE REGISTER



FLEXAIR REGISTER



PLIAVANE REGISTER

NAMES YOU KNOW and names YOU'LL HEAR A LOT ABOUT IN THE FUTURE

FOR years you've known the Tuttle & Bailey line. You have recognized its outstanding position in the industry, and you have applauded the fact that it is superbly built, efficiently engineered. Now we can tell you that despite heavy wartime responsibilities, our engineers have somehow found time to capitalize the invaluable experience which has come with the new and greater challenge of War Production, and are planning for the future. Tuttle & Bailey pledge to you that they will be ready with the best designed, best engineered, best built line of Registers, Grilles, Intakes, Ceiling Diffusers, and Air Control Devices for the postwar world.

REGISTERS, GRILLES AND OTHER AIR CONTROL DEVICES CAN BE SUPPLIED NOW SUBJECT TO THE EXISTING GOVERNMENT REGULATIONS.



TUTTLE & BAILEY

Incorporated

NEW BRITAIN, CONN.

The best the Industry affords now - and tomorrow.

develops power-generates light-flies bombers-drives ships-hauls trains-turns wheels -warms home, office and factory.

wears no uniform—but will do a gigantic part to win the war. NOW

more than ever be- SAVE FUEL fore it is your duty to

A recent survey by one of the world's leading coal companies discloses the astonishing discovery that up to 50% of the heat from fuel is wasted through improper, hand controlled dampers—that 2,000,-000 tons of coal a year can be saved by proper Automatic Draft Control.

SO . . with less fuel promised all around, a WALKER AUTOMATIC DRAFT REGULATOR is the answer for everyone who wants to keep warm and cooperate with the national demand to SAVE FUEL.



WALKER FUEL SAVER TYPE 34-B AND 34C WITH STOVE PIPE TEE JOINT

More than 4,500,000 units of these famous WALKER Regula-fors have been installed for the fuel users of America. Fur-nished in sizes 3" to 10" inclu-sive, in blue, chrome or cad-mium, if and when available, and packed in individual car-tons or bulk.



COMMERCIAL AND IN-DUSTRIAL FUEL SAVER DRAFT REGULATOR

Walker makes a full line of in-dustrial controls. Sizes 16" to 36" inclusive, made of heavy cast ring with deep-drawn flanged steel plate with ad-justable ball-bearing construc-tion. For use with the heaviest drafts and any kind of fuel.



WALKER FUEL SAVER. TYPE NO. 34

maintains proper draft regula-tions under all conditions for furnace, boiler, stove or hot water heater. Domestic sizes 4" to 20" inclusive, furnished with or without collar, in either Galvanized metal or Cadmium Plated finish, if and when available.

WORLD'S LARGEST PLANT MANUFACTURING ONLY DRAFT REGULATORS

This mammoth plant which is two stories and contains more than 110,000 sq. ft. of floor space is indeed a fitting monument to Walker aggressiveness. With a capacity of over 2,000,000 units yearly, you are assured of not only the finest quality and most efficient draft regulators available, but excellent service as well!

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1944



In time of war and in time of peace

Wagner meets the need for DEPENDABLE MOTORS

THE precision-building skill and experience gained by Wagner in more than half a century of producing dependable motors is reflected in the reliable performance of thousands of Wagner motors now in use in airconditioning equipment.

Today, our country and our allies need motors to do jobs on air-conditioning equipment on combat vessels and troopships, in factories, in army cantonments . . . Wagner is all-out to meet this emergency and is furnishing motors wherever they are needed.

If the equipment you manufacture or install is motor driven and essential to war production or to the armed forces-consult the nearest of Wagner's 29 branch offices, located in principal cities and manned by trained field engineers.



Polyphase Squirrel-Cage Motors 1/6 to 400-hp.



M43-22

Shaded-Pole Fan Motors 1/125, 1/80, 1/40 and 1/30-hp.

Capacitor-Start Induction-Run Motors 1/8 to 3/4-hp.

SEND FOR COPIES OF BULLETINS MU-182 & MU-183

BUY U. S. WAR BONDS & STAMPS

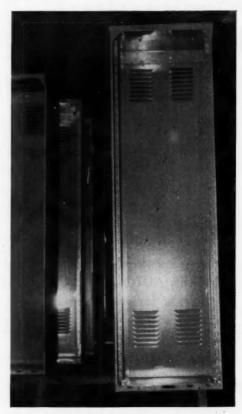
Wagner Electric Corporation 6371 Plymouth Avenue, St. Louis, 14, Mo., U.S.A. ELECTRICAL AND AUTOMOTIVE PRODUCTS

A Furnace Dealer "Keeps 'em Fighting"

(Continued from page 152)

-this is done with saucer wheels and flexible discs and each unit is then inspected for finish.

The prime coat is sprayed on and the piece is oven baked. Final finish is navy gray, also sprayed and oven baked. In the plant of the finisher a crew of women also puts on all hardware and trim after painting and if any poor spots show up in the finish this



Inside of a cabinet showing holes in upright angles. Holes have a permitted tolerance of only 1/64-inch horizontally and vertically between holes. This was one of the toughest forming specifications to meet.

same crew touches up the bad places so the spot can be resprayed. Each units is then wrapped in heavy paper for delivery to the prime contractor who installs the electrical equipment.

Since this contract was obtained Mid-West has completed several thousands of each type of cabinet and front panels and rectostarters. Careful workmanship, all through fabrication steps has kept rejects to a negligible number-no complete rejection. President Carr of Mid-West gives full credit for this successful operation to the enthusiasm, ingenuity and willingness to learn new tricks of the organization's key menengineer M. C. Toliver and superintendent John Gerlach.

Joseph W. Auer, 721 South First St., Belleville, Illinois, has retired from the sheet metal business at the age of 60. His son, Eugene John Auer, is now working for the Belleville Sheet Metal Shop.



It's none too early to begin planning your post-war selling activity. As always, the unit you sell will go a long way toward deciding your success . . . When you begin making plans for your future, get in touch with Rudy. Experience and know-how are your best guarantee of pleasant, profitable post-war sales . . . Meanwhile, Rudy has furnaces available for present essential requirements. Why not make plans *now* to get in touch with Rudy the next time you need heating equipment?

Coal, Oil and Gas Furnaces and Air Conditioners



Water Heaters and a Full Line of Heating Accessories

RUDY FURNACE COMPANY . DOWAGIAC, MICHIGAN

AMERICAN ARTISAN, January, 1944

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FPHA's Heating Correction Guide

(Continued from page 123)

Forced Warm Air (Project Operated)

(Recirculating System)

1. Insufficient air at supply outlets.

(a) Increase fan speed by changing or adjusting pulley on motor (may require change to large motor).

(b) Fresh air intake to have wire protection mesh not smaller than $\frac{1}{2}$ inch.

(c) Attempt operation without filters unless excessively dusty conditions necessitate their use. (If filters are found to be necessary, use throwaway type and replace at least three times a season.)

(d) Return openings not to be covered with mesh smaller than ¼ inch.

2. Crawl space open.

(a) Enclose space. See Illustration No. 1.

3. Inadequate storm protection.

(a) Provide storm doors and windows (except for +15 degree design temperature).

(b) Provide ceiling insulation to give "U" factor of 0.08 (this should be done in all heating zones).

4. Uneven heating between rooms.

(a) Provide adjustable scoops, deflectors or volume dampers. See Illustration No. 5.

5. Duct work unworkmanlike reflected by sagging and open joints.

(a) Make joints mechanically tight and provide additional supports where required.

Frequent periods of overheating and underheating.

*Does not apply where system employs automatic air by-pass.

(a) In general, regulate system so fan operates practically continuously, fan being controlled solely by bonnet fan switch. Locate bonnet fan switch on duct work near bonnet.

(b) Set low point of bonnet fan switch as low as practical without causing relatively cold air.

(c) Disconnect room thermostats when system is coal, hand fired.

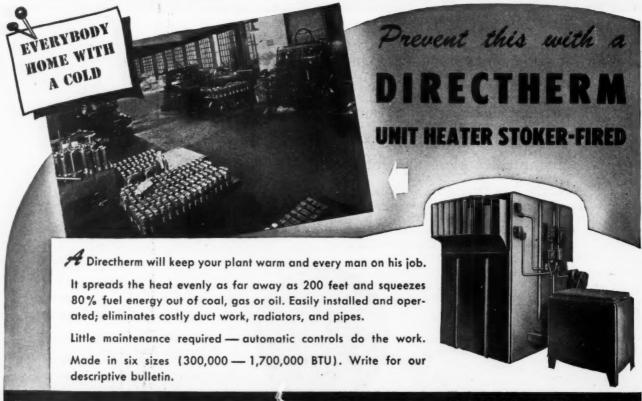
7. High furnace room temperature.

(a) Cover with insulation warm air duct work in furnace room and also top of furnace bonnet.

8. Poor combustion due to insufficient air.

(a) Provide openings or additional openings in furnace room (this can be accomplished by block-

*Before making th's change, test return system by measuring temperature and quantity of air returning to blower.



AIRTHERM

MANUFACTURING COMPANY

706 SO. SPRING AVENUE, ST. LOUIS 10, MISSOURI

.. are "up-ing "production throughout industry!

for welding operations, pressure blowers for general purposes, fans for localized ventilation, and humidifiers, louvers, roof ventilators, hood exhausters, equalizers, etc. for other industrial and ordnance requirements. Typical of CHELSEA engineering and design resourcefulness are the OCTOPUS and

n is our business. CHELSEA facilities include those for manufacturing Fans and Blowers of every type and size, to meet all requirements. Your inquiries are invited.





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TYPE OPJ—OCTOPUS JR: Portable Exhauster and Blower



TYPE CP—PRESSURE BLOWER General Purpose Pressure Type



TYPE IND-INDUSTRIAL For Factories, Foundries,



TYPE DXB-BOOSTER For Spray Booths, Fumer, Excessive Heat



TYPE DUB-SHIPHOLD EXHAUST
Blower or Exhauster



TYPE PH—PENTHOUSE Roof Ventilator



-UTILITY

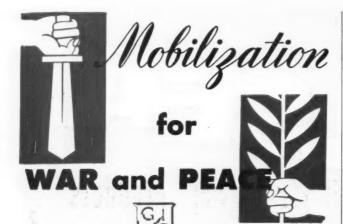


TYPE LWL-SHUTTER LOUVERS Automatic, Regular and Ceiling Models

CHELSEA FAN & BLOWER COMPANY

1206 GROVE STREET

IRVINGTON, NEW JERSEY



One of the outstanding features of the mobilization of industry for war production is the interchange of ideas and information among manufacturers. The pooling of vital information, unlocking the door to heretofore closely guarded "trade secrets," will help immeasurably to hasten the day of Victory. It will also contribute liberally to the improvement in construction and design of post-war products.

While concentrating on our job of turning out automatic controls for the engines of modern warfare, we are using specialized skills gained in working with new materials, new methods of fabrication. When the time comes, this knowledge will be used to help raise the already high American standards of living and production efficiency to even greater heights.

Write for Catalog 52



- 1. Compact Tamper-Proof Cover securely held—No external gas ways.
- 2. Integral Pilot Valve Assembly—Accessible . . . Easily tightened—Rigid vent connection.
- 3. New, stronger Valve Bodies—Hi-tensile iron . . . Increased seating pressure . . . Maximum capacities.
- 4. Binding Posts Securely Locked—Prevent turning... Terminal connections can be made with a screwdriver.



All 8-60 Gas Valves furnished with heavyduty pilot generator for use with liquefied, petroleum gases. These improved valves are completely self-operating—no external current required. Operates on current supplied by pilot burner thermocouple generator, which supplies direct, harmless valve control. All valve parts completely sealed. For complete specifications write for Catalog 52. ing of windows). Net area of openings shall be at least twice inside area of stack.

9. Improper air circulation within rooms.

- (a) Supply grilles with horizontal deflectors should be adjusted for downward deflection.
- (b) In large rooms having high side wall supply outlets, relocate supply outlets near floor (not considered necessary for +15 degree design zone).
- (c) Where no return circulation is provided in dormitory rooms, provide such circulation by creating opening at floor from each room to corridor (can be readily accomplished by cutting bottom of door).

C

a

10. Excessive temperature drop between air temperature in duct where it leaves furnace and the air discharge temperature at last supply outlet.

(a) When temperature drop exceeds about 35 degrees F., duct work will require additional insulation.

11. In addition to the foregoing, the following problem and solutions are applicable to the DD series of dormitories:

Air quantities delivered are small since this system is based on buildings having a high degree of insulation and a small quantity of high temperature air delivered. Investigation indicates buildings to be deficient in insulation and in addition air distributional difficulties have been encountered because of low quantities of circulated air.

(a) Decrease heat loss by adding insulation and

storm protection wherever practical.

(b) Increase air supply 100 per cent. This may be accomplished by (1) speeding up fan requiring a change in pulley size and probably a change to larger motor, or (2) substituting for present equipment a complete blower motor unit.

*(c) In lieu of present return system, provide a more direct method by utilizing corridors for air returns. It will be required to (1) block present return outlets in dormitory rooms, (2) provide circulation between dormitory rooms and corridor (can be readily accomplished by cutting bottoms of doors), and (3) at ends of corridors, provide direct duct connections to blowers.

(d) If actual construction results in heat loss in excess of existing furnace capacity increase capacity by (1) adding automatic firing equipment

or (2) replacing furnace.

CMP-9A, Repair Material Order

(Continued from page 111)

nance service for a 60-day period, according to his current method of operation. A repairman may not accept delivery of any item of copper wire if his inventory of that item is or would by accepting delivery become more than he needs for a 15-day period. However, if the supply of any item which he has on hand is less than the permitted amount, he may accept delivery of the smallest commercial amount of that item which his distributor normally sells, even if that will increase his supply beyond the amount specified.

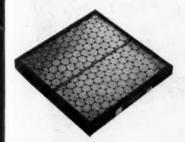


How to find extra profits without extra clerks

With salespeople scarcer than the well-known hen's teeth and with merchandise and materials doing the vanishing act you, you can still keep the cash register from getting rusty, by pushing this profitable repeat item that's quickly available—DUST-STOP* AIR FILTERS.

Here's the story : National magazine advertising is telling owners of forced-warm-air furnaces the fuel-saving advantages of changing their air filters.

Now, with the aid of DUST-STOP's free dealer helps you step in and cash in ...



You GET attractive folders to mail to all prospects. You get follow-up post cards . . . news-paper-ad mats . . . radio scripts to use on your local station . . . furnace reminder labels . . . window and counter displays.

Also you receive a display manual illustrated with photos and diagrams showing how to make displays that pay. In addition you get a catalog of filter sizes. It tells you how many and what size filters are used in almost all makes of forced-warm-air furnaces. Over-the-counter and telephone orders are easy to handle with the quick reference book.

This sales plan has been rightly called "Pulling Profits out of the Air." Ask your Dust-Stop distributor

about it today, or write: Owens-Corning Fiberglas Corporation, Toledo 1, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.



FIBERGLAS'

DUSTOP* AIR F

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How to

Raise Wages

(Continued from page 95)

A "job classification" is a category of jobs or positions which are similar in nature and content and in required amount of knowledge, skill, experience, and responsibility. A job classification involves more than a mere descriptive title; the classification must be clearly defined and described. Where jobs differ as to knowledge, skill, experience, and responsibility, there should be different job classifications. (For example, typists, stenographers, and secretaries should each be considered separate job classifications because the respective work differs as to skill, content, and responsibility. These three categories may not be grouped together in one job classification.)

A "job classification *rate*" exists where an employer pays a single rate rather than a range of rates for a given job classification. Jobs remunerated on a piecerate basis are normally considered to be in single-rate job classifications.

A "job classification rate range" exists where an employer pays, for a given job classification, a number of rates varying from a clearly designated minimum rate to a clearly designated maximum rate.

The "minimum and maximum rates" are not necessarily the lowest and highest rates being paid at a given time for a particular job classification. For special reasons (e. g., lack of experience or superior ability) particular employees may be receiving less than the minimum or more than the maximum rate.

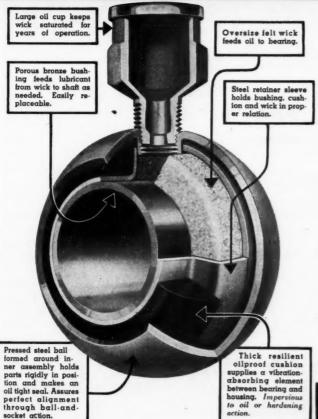
Moreover, it may happen at a given time that no employee is receiving the actual minimum or maximum rate for a particular job classification.

"Promotions or reclassifications" involve individual adjustments which result from moving an employee into a different job classification. Promotions and reclassifications may be made between jobs which bear single rates as well as between jobs which bear rate ranges. When promoted or reclassified to a higher-rated job, an employee (subject to National War Labor Board jurisdiction) may receive a rate not in excess of 15 per cent above his rate on his former job or the minimum rate for the new job, whichever is higher; provided, however, that where an employee has special ability and experience, he may be paid a rate within the appropriate range corresponding to such ability and experience.

"Apprentice or trainee programs" involve individual rate adjustments resulting from improvement, over specified periods of time, in the productive abilities of apprentices or trainees who are employed under a bona-fide apprentice or trainee program as defined below. Under these programs, adjustments may be made with respect to jobs which bear single rates as well as with respect to jobs which bear rate ranges. Apprenticeship or trainee programs for a given job classification-with respect to length of apprenticeship or learner period; proportion of number of apprentices or learners to number of experienced workmen; and relation of apprentice or learner wage rate at various periods to the rate paid to experienced workmen-should conform to the standards set forth in a collective bargaining agreement or in the applicable regulations of federal or state agencies. The re-examination or modification of existing apprentice



No Other Bearing In Air Conditioning



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has all these QUALITY FEATURES

In designing your after-the-war fans, blowers, and other devices requiring silent operation, perfect alignment and self-lubrication—include the Triangle Shock-Absorbing Pillow Block.

- It is the only bearing for air conditioning that has a resilient oil-proof cushion scientifically built into the bearing-for silence and vibration absorption.
- Ball-and-socket design for perfect alignment.

Scientifically streamlined for 3. Scientifically strength compactness, simplicity, strength and MINIMUM OBSTRUCTION TO AIR FLOW.

Cut-away view shows other features and illustrates how unique engineering has created a new type of silent bearing outstandingly different from the conventional.

Triangle design as-sures high efficiency and low cost operation.

Patented

One of several types of mo

TRIANGLE MANUFACTURING CO. 392 DIVISION STREET OSHKOSH, WISCONSIN

Padentilating

An Automatic Shutter with Many Advantages!

Its patented spring counterbalance makes it unusually sensitive to air currents, causing the louvres to open instantly when the fan is turned on and snap tight shut when the fan is turned off.

The spring mechanism can be easily adjusted according to the air velocity, thus making the shutter adaptable to a wide range of uses.

Completely weather-stripped around the inner edge of the frame so that it is draft-proof, insect-proof, and rattle-proof.

Made in sizes from 10" to 60" square also rectangular.

All-Steel Motorized Shutter

Used for exhaust ventilation in industrial, commercial and residential buildings. Automatically controlled by fan switch. Six-second opening. Positive closing. Storm-proof. All-steel construction.



Elgo Shutter & Manufacturing Co.

6966 W. JEFFERSON

DETROIT 17, MICH.

Elgo Shutters are distributed through fan and air conditioning equipment manufactur-



"ELGO" TYPE Rear View (Closed) AUTOMATIC SHUTTER

6966 W. Jefferson, Detroit 17, Mich.



Please send catalog showing the items checked below: Ceiling Dampers **Automatic Shutters** Hand Operated Shutters Balanced Vent Units

Motorized Shutters

City..... State.....

or trainee programs in the interests of greater production for the war effort is not precluded. Any change in existing apprentice or trainee programs, however, requires Board approval unless made in conformity with changes in the applicable regulations of federal or state agencies.

Keep All Records

Any employer who makes individual wage or salary rate adjustments pursuant to a schedule must hereafter keep available for a period of two years records showing (1) for each job classification (a) the rate or range of rates and (b) the description; (2) a statement of the plan of making adjustments within the rate ranges and between the rates or rate ranges; (3) the date when the schedule was established; (4) for each employee who received an adjustment, his name, the date hired, the date of and the reason for adjustment, the job classification, and the rate of pay before and after the adjustment. No particular order or form is prescribed for these records, provided that the information required is readily obtainable.

If there is a duly recognized or certified labor organization which is entitled to bargain on wage matters for any or all of the employees included in a proposed schedule or in a proposed change in an existing schedule, approval must be jointly requested by the employer and such labor organization, or that part of the schedule which directly involves employees represented by such labor organization. Similarly, agreement with such labor organization must be obtained by the employer before he can adopt or change to the plan which does not require Board approval. If an agreement on any point cannot be reached, the parties

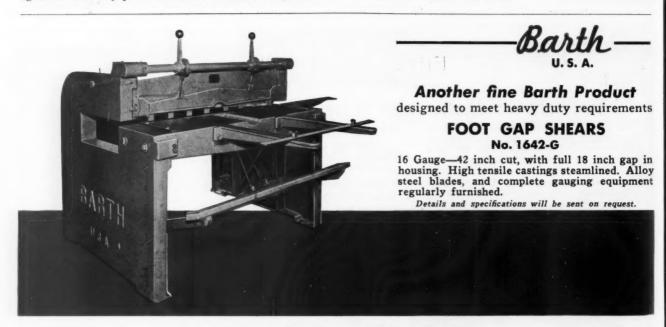
may jointly submit the issues to the appropriate Regional War Labor Board for determination or may ask the Regional Board to refer the matter to the National War Labor Board for determination. Failing joint submission, the matter will be treated as a dispute case.

NWAH & AC Ass'n History

(Continued from page 171)

than in the heyday of 1929. The cost to the Association has been very much less, and the results obtained have, in my opinion, been every bit as important during the last two years as during any period of our research activity.

"No report of this kind would be complete without a word of appreciation to Professor Willard, Professor Kratz, Mr. Konzo and Mr. Harris of the Research Staff at Urbana. Their work has made names for themselves and for the National Association. It has put us in a position of being at the head of our own profession. May they know that we appreciate their loyalty and untiring effort and the splendid spirit of cooperation that they have shown at all times. It has been a real pleasure and a privilege to know these men and to work with them."



BARTH EQUIPMENT

Foot Squaring Shears
Foot Gap Shears
Bar Folders
Forming Rolls
Slitting Shears
Bar and Rod Shears

Combination Deep Throat
Bench Machines
Wiring Machines
Edging Machines
Turning Machines
Burring Machines

Flanging Machines Crimpers and Beaders Brace and Wire Benders Bench Plates Cast Iron and Steel Stakes Rivet Sets

THE BARTH MANUFACTURING CO.

PLANTSVILLE, CONN. AA

E-Z-ON... The Popular DAMPER REGULATOR for Wartime Heating Systems ...

- Uses less Critical Materials
- Cuts Installation Time in Half
- Easy to Install with Unskilled Helpers

Famous Since 1848 . . .

• Makes attractive, rattle-free job

Standard E-Z-ON



No. 27. % inch bearing. Solid end tail piece.

Simple to Install . . .

The E-Z-ON is a favorite of sheet metal mon everywhere because of the time it saves on every installation. Any man who can swing a hammer can install it. Just slip the regulator over damper edge with prongs over scribed center line. Lay assembly on block of wood, and drive prongs through the sheet metal, then turn over and clinch prongs. Prongs are strong enough to pierce 20-gauge metal.

Snap-Tite E-Z-ON with Retractable Tail Piece



No. 29. % inch bearing. Tail piece with snap end bearing.

This IMPROVED E-Z-ON with Retractable Tail Piece avoids any need for bending the damper or springing the pipe to insert the damper. Just attach the same as the Standard E-Z-ON, then insert the head piece through one end, slide the Snap-Tite Tail Piece over the opposite hole and it automatically snaps through the hole and LOCKS, free of rattle.

E-Z-ON Retractable Tail Piece with Patented Locking Feature



The locking tongue and wedge shaped slot is a patented feature of the Snap-Tite that makes it superior to other snap end bearings. When movable bearings snaps out through pipe hole upon installation, the lug or locking tongue wedges securely in the tapered slot and avoids all chance of rattle, firmly locks into position.

Save labor, time and money on Wartime Damper Installations . . . with E-Z-ONS. Jobbers everywhere stock them.

M. A. GERETT CORPORATION

724 WEST WINNEBAGO STREET - MILWAUKEE 5, WISCONSIN

WISS

BEST BY TEST

In sheet metal working shops the nation over, the name "WISS" is synonymous with fast cutting, high quality snips—snips that are as famous today as they were in 1848.

For 96 years, WISS SNIPS have won recognition for quality performance and maximum value—for strength and long life in hard service—for outstanding ability to meet everything demanded of them.



EVERY TYPE

OF

SNIP

EVERY

KIND

SERVICE

SEND FOR PARTICULARS OF COMPLETE LINE OF



LIGHT METAL SNIP (Jewelers)

J. WISS & SONS CO. NEWARK N. J.

SNIPS

The Complete Quality Line

AMERICAN ARTISAN, January, 1944

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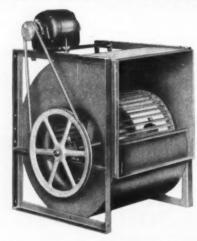
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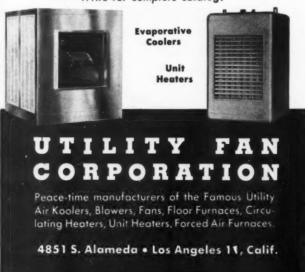


NEW UTILITY STANDARD BLOWERS



The new Utility Standard Blower (Arrangement No. 3) can be installed with top vertical, top horizontal, bottom vertical or bottom horizontal discharge. Four-side angle iron frame makes blower more rigid, eliminates vibration and permits installation where blowers of heavier construction would normally be necessary.

Write for complete catalog.



County Quotas of 200,000 Replacement Furnaces

(Continued from page 136)

TENNESSEE (Continued)

N

Counties	No. 4 Total Furnaces Installed	No. 5 % of State Total	No. 6 Allotment of State Quota (No. Furnaces)
Crockett	14	.03	
Cumberland		.06	
Davidson		32.61	151
Decatur	1		
De Kalb	18	.03	
Dyer	341	.14	1 3
Favette	15	.03	
Fentress	52	.09	
Franklin	303	.54	3
Gibson	177	.32	1
Giles	110	.20	1
Grainger	8	.01	
Greene	282	.50	2
Grundy	44	08	
Hamblen	341	.60 12.88	3 60
Hancock	- 0	12.00	
Hardeman	30	.05	* ****
Hardin		.02	
Hawkins	105	.19	1
Haywood	34.	.06	
Henderson	52	.09	* * * * * *
Henry		.67	3
Hickman		.03	****
Humphreys		.09	
Jackson		.01	
Jefferson		.34	1
Knob		12.89	60
Lake		.02	
Lauderdale		.10	· · · i
Lewis	8	.01	****
Lincoln		.16	1 3
McMinn		.47	2
McNairy	8	.01	
Macon		.01 1.50	7
Marion	85	.15	1
Marshall		.14	1 4
Maury Meigs		.01	****
Monroe		.19	1
Moore		1.11	5
Morgan	34	.06	
Obion		.22	1
Perry		.04	
Pickett	. 4	.01	
Polk		.19	1 2
Rhea	. 59	.10	1
Roane		.60	2 3
Robertson		.99	5
Scott	40	.07	
Sequatchie		.11	····i
Shelby	8,945	15.84	73
Smith		.08	1
Stewart		2.79	13
Sumner	215	.38	2
Tipton		.06	****
Unicoi	172	.30	i
Union			* ****
Van Buren		.37	2
Washington	1,180	2.09	10
Wayne		.02	2
Weakley		.14	1
Williamson	301	.53	2
Wilson	215	.38	2

JOIN-UP with SHEETLOCK

FABRICATE NON-METAL DUCTS at Lower Cost!



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FLAT SHEETLOCK
No. 1 for 1/8" Board
No. 2 for 3/16" Board

No. 3 for 1/4" Board

SHEETLOCK Self-Fastening Strips
Save your time and labor in making Heating, Venti-

lating and Air Conditioning *Ducts!* Specially designed strips (illustrated) with self-locking notches hold all types of sheet board firmly and securely. Simply push board into SHEETLOCK channel.

No cement or caulking compound is necessary. No nails, screws or bolts required.

Sheetlock is also used in manufacturing cabinets, shower stalls, lockers, etc. Solve your fabricating problems by using Sheetlock on all non-metal sheets.

"Fabricating Methods" Booklet-Yours for the Asking!



ANGLE SHEETLOCK

No. 10 for 1/8" Board No. 11 for 3/16" Board No. 12 for 1/4" Board

SHEETLOCK COMPANY

Manufacturers of Self-Fastening Strip

4521 N. CLARK ST.

CHICAGO, ILL.



U-SHEETLOCK STRIP For Use With Drive Cleat No. U1 for 1/8" Board No. U2 for 3/16" Board No. U3 for 1/4" Board



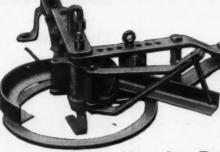
Shows the Self-fastening feature, the uniquely designed notch grips and holds.

The rounded bottom makes a tight joint without the use of cement or putty.

Potented in the U.S. and Canada

The HOSSFELD UNIVERSAL IRON BENDER

Bends Pipe, Bars and Angle Iron



Let the Hossfeld Bender Solve Your Bending Problems

No other Bender on the market like it.

This Powerful, Steel Constructed, Wrenchless, Universal, Pipe, Bar and Angle Iron Bender, will neatly, quickly and accurately turn out most any kind of a bending job that ever comes up, either in maintenance or production work — such as Eye Bolts, "U" shapes, "S" shapes, Links, Circles, Offsets, Braces, Cranks, etc. It will also roll eyes on flat stock for Automobile Springs and the like.

It does a perfect job on Pipe work, bending to any degree or to a continuous coil without flattening it or splitting the seam.

The bending of Angle Iron is an exceptionally wonderful feature of the machine. It forms a smooth perfect curve or circle of any radius desired, without twisting or distorting the stock in the least. It also bends Sharp Square bends on notched Angle Iron.

stock in the least. It also bends Sharp Square bends on notched Angle Iron.

The machine is built in two sizes. The larger size bending up to 2-inch standard pipe, 4½-inch flat bar stock, or $2x2x3_{16}$ -inch angle iron, cold. There are thousands of these machines in use by all classes of trade in the U. S., Canada and other foreign countries.

Write for descriptive literature and prices.

MANUFACTURED ONLY BY

Hossfeld Manufacturing Co



Samples of Bar Bending

Samples of Pipe Bending

For Better AIR-CONDITIONING and HEATING JOBS...

install

Careyduct
AIR CONVEYING SYSTEMS

Even before Pearl Harbor, CAREYDUCT was "going places" ... highly favored by the air-conditioning industry because of its many superior advantages over insulated metal duct. But in the war, with its urgent need for conservation of metal and labor, the acceptance of this prefabricated duct has grown tremendously.

By using CAREYDUCT for present wartime construction, you assure important advantages of conservation plus advanced efficiency features described below.

CAREYDUCT IS AVAILABLE IN FIVE DIFFERENT TYPES



INSULATED AND ACOUSTICAL TYPE

Made of Asbestos — combines both duct and insulation. Simple slip-joint construction and standardized parts provide easy and rapid fitting on job; "hushes" fan noises—reduces "speaking tube" effects.

KEY-LOCK TYPE

For high temperature applications. Impervious to water, and effective for temperatures up to 500°F. This duct is supplementary to the Insulation and Acoustical Type. It is made from Carey Firefoil panel and is delivered knocked-down, with asbestos key for locking.



SINGLE-WALL TYPE

For use in heating and ventilating systems. It is an all asbestos product and is the same as inner core of the Insulated and Acoustical Type.

HINGED-CORNER TYPE

Fabricated of 1/8" asbestos board and is for use in residential heating jobs. It is delivered in cartons ready for assembly.



ASBESTOS-CEMENT TYPE

Made of different thicknesses of asbestos-cement wall board, in sizes from 231/2" up. It is supplied with special asbestos corners and is shipped knocked-down, complete with duct turns, sheet metal screws, connector pieces and Careyduct adhesive.

Send for Careyduct Manual-Address Dept. 100.

THE PHILIP CAREY MFG. COMPANY

Dependable Products Since 1873 Lockland, Cincinnati, Ohio

Post War Should Be A Period of Expansion

(Continued from page 116)

restrictions as fast as is practical. We have all had enough experience with governmental control to appreciate the importance of free enterprise. It might be advisable for our manufacturers' association to have a legislative committee to protect our interests against any further encroachments in the normal operation of our business. We must aid in guarding public expenditures and we must be active in all new proposals of tax legislation.

Profits have been limited through heavy taxation and renegotiation as emergency measures. The postwar period, however, should be a time in which industry can, through its own efficiencies and initiative, achieve reasonable profits and thereby build up reasonable reserves, without which no enterprise can long exist. After this war is over, the incentive to do business must be restored.

We are now entering on an era of growth and expansion for the warm air heating industry. To take full advantage of the opportunities that will be offered in this era and at the same time cope with the problems just mentioned, it will be necessary for the officers to have the complete cooperation and the personal assistance of every member of this Association. We will also need the active cooperation of every jobber and every dealer.

Let us get our program into full swing immediately and with this mutual cooperation enter into this era of expansion and growth with confidence and with hopefulness for the years to come.

YOUR BLOWER

Requirements

AVAILABLE AT
Schwitzer-Cummins Company



* BLOWERS

FOR EVERY PURPOSE

Double Inlet and Single Inlet

HY-DUTY Blowers, 93/4" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical

Discharge • Top and Bottom

Motor Mounting • Dual Units also available.

★ CENTER DISC WHEEL—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".



★ ENGINEERING DATA—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
1145 EAST 22ND STREET INDIANAPOLIS, U.S. A

Kruckman—The Manpower Picture

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(Continued from page 103)

as 40%. Hot meals, short rest periods, recreational facilities, better light or ventilation, giving the worker a greater sense of participation through inviting suggestions, and keeping him informed of plant progress and change, have all been found to contribute to greater efficiency. . . . A 10% increase in labor efficiency is equivalent to a 10% increase in your labor force. . . . Worker efficiency and rates of turnover and absenteeism depend upon conditions of life outside as well as inside the plant. Wichita, Kansas, a war boom community-the population has doubled since 1940-is successfully meeting its production and manpower problem. One of the reasons is plain. Stores and banks are open at night; movies run midnight shows; there are dances for late shift workers; transportation schedules have been adjusted to the convenience of war plants; ample new housing has been provided. The press, the schools, the churches all cooperate. . . . As the war continues, manpower stringencies will get tougher. The war industries and the armed services require several million more persons before leveling off. The three chief sources of manpower remaining are: (1) idle persons, chiefly women, who are not in the labor force; (2) persons engaged in non-essential activities; and (3) more efficient employment of those already in plants. Andnational service legislation is essential for the mobilization needed for earliest possible victory."



Here is an example of the type of service that wins friends for

GEHL STOKERS



IN 1935 The First Methodist Church of Milwaukee, Wisconsin, installed a Gehl Stoker. In 1936 they wrote:

e "... The entire new system has worked to such advantage that we used about one-half the coal previously required . . ."

(The saving quoted for the first year was \$365.33.)

IN 1943 The church wrote:

• "... the Chairman of our house committee estimates that the Stoker has more than paid for itself. In addition to the economy, it is a very great satisfaction and comfort to all our people."

*Copies of complete letters on request.



Models for factories, warehouses, public buildings, office buildings, spartment buildings, schools and churches.

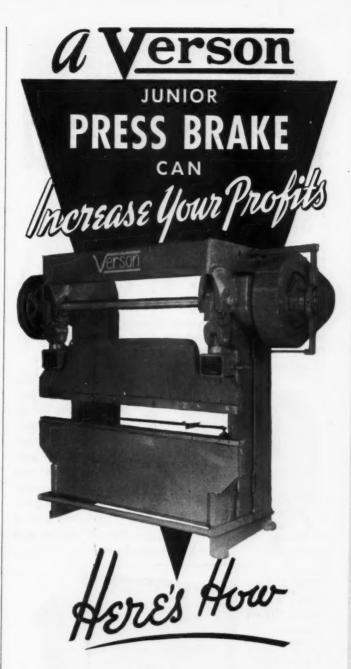
Write for catalog and our plan of dealer cooperation

GEHL BROS. MFG. CO.

Established 1867 Dept. BA-800 West Bend, Wisconsin

A GEHL WINS FRIENDS WHEREVER IT GOES

AMERICAN ARTISAN, January, 1944



•It is axiomatic that, if you handle more jobs at lower operating costs, your profits will swell. A Verson Junior Press Brake in your shop enables you to handle more work. It gives you the added speed, versatility and job quality of a big brake—but, at small machine economy. Built in seven sizes, there is a Verson Junior Press Brake for every purpose—every purse.

Send for details...Ask to see a Verson engineer

VERSON ALLSTEEL PRESS CO.

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SIMPLEX AUTOMATIC DRAFT CONTROLS Save up to 25% in Fuel

5 in 1 "SIM-TROL"

The SIM-TROL control with Simplex adjustable sleeve is adjustable to breechings (or smoke flues) from 8" to 12" inclusive, which covers



the range of most domestic heating plants. Will save up to 25% in fuel; maintains draft at 1/100 of an inch of the desired point under all conditions,

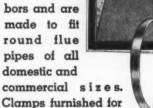


Type H Sim-Trol
Automatic Fuel
Saver, made for all
types of firing—gas,
oil, stoker or hand
—makes more heat
possible from less
fuel and cuts smoke
output. Holds draft

within 1/100 of an inch of desired point. Makes any boiler better.

Type F Sim-Trol Automatic Draft Controls 14" and over have dustproof ball bearing arbors and are made to fit round flue pipes of all domestic and

fastening to pipe.





Simplex Automatic Draft Controls are made in many different types to conform with the smallest or the largest boiler plants.

Write for complete details on the Simplex line.

SIMPLEX
MANUFACTURING COMPANY
FOND DU LAC, WISCONSIN

Labor Scarcities to Grow

Here is how it appears to another Government agency. The Bureau of Agricultural Economics reported: "Civilian employment has passed its war time peak. The number of employees in non-agricultural establishments has been declining since December, 1942, even after seasonal adjustment. The latest Census report on the labor force shows a decline in civilian labor force of nearly 2,000,000 from the peak reached in July, 1942, and also estimates that total civilian employment in August, 1943, was lower than in July, 1943, or August, 1942. Announced plans for increasing the armed forces to such an extent" (300,000 to 500,000 per month until the end of December, 1943) "that inductions will continue for some time to more than offset additions to the labor force. The effect will be a slight decrease in civilian employment."

Selective Service, now divorced by Congress from WMC, reports 300,000 will be drafted in January. WMC reports the armed forces and the war industries together will add to their numbers an aggregate of 3,600,000 persons by July 1, 1944. The armed forces will expand by 2,000,000, and the war industries by 1,600,000. This will bring the total in the armed forces to 11,300,000, and in the war industries to This will take from civilian non-war 11,600,000. industries 2,300,000 workers, not including agriculture. No workers are to be taken from the farms, which now have 12,000,000 workers. It will interest you especially to learn that it is expected the building trades and the workers in industries making the equipment and materials that go into buildings must be reduced by at least 600,000 persons who will inevitably be forced into the war industries. Trade-



wholesale and retail distribution-and service industries, such as laundries and sheet metal workers and similar services, are expected to supply 700,000. Workers in industries that supply clothing, textiles, shoes, particularly are to be kept at minimum. Nonwar Government agencies also are to be shorn of workers. The undetermined deficit is to be obtained from the normal increment resulting from population growth and from the ranks of retired workers, women, adolescents, etc. This undetermined deficit obviously will be created by the needs of the armed services which must draw on the civilian labor force otherwise available for war industries.

There also is the unknown quantity of the unexpected requirements of the armed services created by the unexpected contingencies of the campaigns in the various global areas. Incidentally, for what it is worth, it is recorded the grand total of those employed in all civilian industries, war and non-war, in agriculture, and those serving in the army and navy, by the end of the fiscal year of 1944 will aggregate 66,-300,000, or approximately half the population of the United States. The figure is interesting in the light of Mr. Mitchell's statement that our manpower contribution is far below the numbers participating in any other major nation. The number actually serving in the armed forces, and in the war labor force will apparently total 35,900,000, if agricultural workers are included. If agriculture is excluded the total will be 23,900,000; but since agricultural products either directly or indirectly mainly contribute to the war it is regarded as reasonable to classify the workers as war workers.

The Department of Labor comments upon the situa-



ANY METAL-ANY PERFORATION



5649 Fillmore St., Chicago 44, III. 114 Liberty St., New York 8, N. Y

HOW TO HEAD A RIVET IN A TUBE

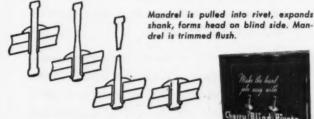


CHERRY BLIND RIVETS

CHERRY BLIND RIVETS are ideal for riveting tubing to elbows, brackets or other tubing. Here, short length Cherry Rivets are headed on the inside of the tubing.

The Cherry Rivet is a mechanical blind rivet headed by means of a mandrel passing through it. A gun exerts a pulling force on the mandrel, expands the shank of the rivet and forms a tulip head on the blind side, the head on outside conforming to the radius of tube.

If you need to speed up war jobs or are planning new products, get the complete story on Cherry Rivets now. See how they will save time and money. Give you a better job in many types of applications.



GET NEW HANDBOOK. See how Cherry Rivets have been proved in aircraft. Write to Department A-200, Cherry Rivet Company, 231 Winston Street, Los Angeles 13, California.

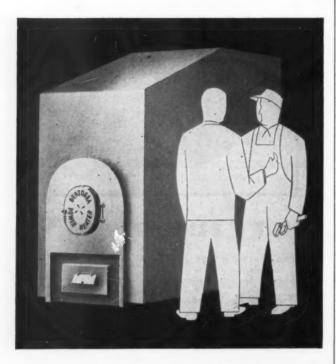


Cherry Rivets, their manufacture and application are covered by U. S. Patents issued and panding



Power Heaters

FROM 300,000 to 2,800,000 B.T.U'S PER UNIT —TODAY THEY'RE WORKING FOR UNCLE SAM • TOMORROW THEY'LL MEAN PROFITS FOR YOU



Bertossa Power Heaters are today working overtime heating army camps, navy bases, hospitals, utility buildings, etc., for United Nations forces all over the world. And here at home they are being specified by heating engineers and architects for homes, churches and industrial buildings.

This popularity is due to (1) compactness of complete blower and heating unit; (2) down draft flue for increased efficiency; (3) 90% direct heating surface and (4) adaptability for complete air conditioning.

From every standpoint the Bertossa has proven its effectiveness on the job—and likewise its profit opportunities to live-wire dealers.

Bertossa

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN

tion thus: "In the coming year, with no reserve of available unemployed, we face an intensive task of transferring workers from industry to the armed forces, from industry to industry, and from area to area. . . . Full utilization of workers and elimination of labor hoarding have been assumed in the estimates: if these objectives are not achieved, the labor need will be increased. Replacement of younger workers entering the armed forces requires an intensification of training and upgrading on a broad scale. Turnover must be kept at a minimum in order to avoid loss of time and efficiency. Intensive recruitment measures are necessary to assure full utilization of women, negroes, and other available labor reserves in shortage areas. Transfer of workers from area to area will be required in many areas."

Over-all efficiency of men and machines is 20% better than before the war, but Mr. McNutt told the Senate Military Affairs Committee the labor force still could be used 25% more effectively. Apparently the result might be achieved by the 48 hour schedule now almost universally in force; by incentive wages; and by putting women in white collar jobs and men in plants, factories, and heavier industries. O. W. O. Lee, head of WMC Bureau of Utilization urges more production may be accomplished by improvement of the caliber of foremen; better layout and treatment of specific jobs; training operators to do better specific jobs; and actual measurement of performance on the job. It is reasonable to assume that the principle of Badeaux's much hammered speed-up system already may have quietly been adopted by some industries.

Brig.-Gen. B. W. Chidlaw of Army Air Forces has told about a plant which performed an operation in 14 hours. Another plant, on the same operation in-

HEC DAMPER REGULATOR SETS



ECONOMY TYPE. Three ways to Install: I. With lock nut but without handle (for tamper-proof settling).

2. With handle and lock nut. 3. With handle and wing nut. Nut prevents damper vibration. Handle always indicates position of damper (Patent 2,146,142). Furnished with handy snap end bearing. Complete set in carton. Made only with 1/4" bearings.

LIST PRICE..... No. 401/45....\$0.30



BRACKET TYPE. Nut holds damper securely, preventing vibration. Handle which indicates position of damper, may be left in place permanently or removed after adjustment (to prevent tampering). Snap End Bearing on 1/4" size, Solid Bearing on 3/8" size. Each set individually packaged.

LIST PRICES....No. 501/4....\$0.40 No. 503/8\$0.60



DISK TYPE. Like all H&C sets, this set is equally adaptable to splitter or regular dampers. Snap End Bearing on ½" size. Solid Bearing on 56" size. All parts are rust proofed. Complete set in carton. LIST PRICES....No. 80½.....\$0.40
No. 80½.....\$0.40.

See your jobber or write for literature and sample.

HART & COOLEY MANUFACTURING CO. HOLLAND, MICH. - PHILADELPHIA OFFICE: 1600 ARCH ST.

volving an identical piece of equipment took 200 It was discovered the work could be done properly in 38 to 40 man-hours. We are generally told employers do not intentionally waste labor; they simply do not know how to use it. At the same time apparently everyone in Washington is convinced the cost-plus-fixed-fee contract must be changed to the here on the Hill that a great part of the labor shortage on the West Coast is due to the operation of the costplus-fixed-fee contract. There seems no doubt many of the larger plants have created labor stockpiles that immobilize thousands of workers. Shipyards on the West Coast easily dispensed with 100,000 workers. The Unions generally are given part of the blame. The expansion of the labor forces in the plants enlarges the Union membership roster which in turn swells the Union treasury. Literally hundreds of workers have written to Congressmen complaining they scarcely have any work except to draw their wages.

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The "West Coast Plan"

Deputy Administrator Leo R. Werts, inventor of the "locally needed" plan, which was expanded to regional uses on the Coast, recently returned from the West to discuss details with his associates in WMC. The labor-rationing program undoubtedly is successful out there. There is a welter of detail published about the plan. But its essence is simple. The purpose is to ration the labor of men and women where working men and women theoretically are scarce. One of the Congressmen from the West says the scarcity in the West is 90% phoney. Perhaps he knows. WMC, at least, believes there is a very real scarcity



DISTINCTIVE FEATURES — The soft steel blades are made in pairs, pressed thru slots in the heavy steel back plate, then welded to the plate. The blade tips are pressed thru slots in the inlet disc then bent back against the spring of the steel blades. This patented construction results in an exceptionally rigid wheel and prevents loose blades, as no rivets are used in fastening the blades. The heavy cast iron machined hub is riveted to the back plate and will not crack or become loose on the shaft.

Janette Manufacturing Co - 556-558 W Municop St - Chicago -

All the advantages

of Terne roofing

PLUS 4 MORE

FOLLANSBEE SEAMLESS
ROLL ROOFING

The advantages of Terne roofing are generally recognized—better all-around protection against the elements . . . lighter weight . . . fire-retarding properties . . . protection against lightning.

Follansbee Seamless Terne Roll Roofing, made in 50 and 100 foot lengths that eliminat seams, gives you all these, plus four portant advantages:

- Lessier to Handle—The seamless rolls have uniformly straight edges and are free of buckles—no field trimming to correct for camber.
- 2. Saves Time and Materials—The elimination of cross seams affords substantial savings, particularly on larger areas.
- 3. More Durable, Less Maintenance—The weak point in any roofing is the joint; hence the far superior durability and reduced maintenance of the seamless application.
- 4. Smooth, Improved Appearance—No cross seams mar the smart appearance of standing vertical seams, which lend themselves so well to a wide variety of architectural designs.

Only Follansbee—with its reputation for the highest quality Terne Plate—manufactures Seamless Terne Roll Roofing. Owing to wartime restrictions, it is now available in only the 8 pound coating and its use is limited to essential maintenance and repair. Write for data on widths, coatings, and costs for use in preparing your specifications and estimates.

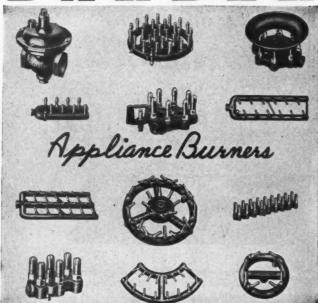
FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES • PITTSBURGH 30, PA.



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SEAMLESS TERNE ROLL ROOFING * POLISHED BLUE SHEETS ELECTRICAL SHEETS & STRIP * ALLOY BLOOMS, BILLETS, BARS, SHEETS & STRIP * COLD ROLLED SHEETS & STRIP

BARBER



Be Ready When the Great Day Comes!



Appliance manufacturers, jobbers, dealers, and fuel suppliers, now mainly concerned with our total war effort, must ALSO be awake to the necessity of planning for post-war business. The entire gas industry confidently looks forward to an era of increased prosper-

ity, the extension of areas served by natural gas, and greater developments in the use of manufactured and liquid gases.

Here at Barber we long ago subordinated our customary line to the making of important aircraft parts, but fortunately have been able to retain intact our shop equipment and key staff, so that the transition back to our regular production will thus be facilitated. Refinements of design in burners and regulators, as well as better production methods, worked out by Barber during this wartime production period, will later enhance the value of ALL Barber products.

Barber Burners and Regulators are today available only in accordance with Federal restrictions. For new uses and new business on conversion burners, appliance burners, and pressure regulators, when normal conditions are restored—let Barber engineers plan with you NOW. Be ready to get YOUR share of the coming peace-time prosperity.

We are gas burner specialists, and offer you our engineering and plant facilities for the development and manufacture of burner units for your specific purposes. Write for Catalog illustrating and listing many types of burners for Appliances, Gas Burners for Furnaces and Boilers, Regulators, etc.

THE BARBER GAS BURNER CO.

3704 Superior Ave., Cleveland, Ohio

BARBER Jet GAS BURNERS

in the States of California, Oregon, and Washington. These States have been integrated into the equivalent of an area which is deemed to require labor stabilization. The original community area was labelled as a "locally needed" area. This meant where a critical labor shortage existed, civilian trades, services and industries, serving the workers in the war industries of the community, were entitled locally to the protection of the essentiality classification, in order that they might retain their workers, and obtain materials. It protected them against prior rights of war industries in the area. But it did not protect their workers against national draft operations. In effect the workers were frozen in their jobs, and could leave them only with permission of their employers and approval of the Government. For this the employer was compelled to give guarantees protecting the rights of races, creeds, color, special consideration for women and children, agree to minimum wage rates and maximum hours. Also other social safeguards.

Most of this program on October 15 blanketwise covered practically all jobs in all the country. At the same time the area and regional directors of WMC were practically made autonomous in governing the application of the program in their communities. They are now the bosses in their areas and regions. In effect they are labor czars. The principle is the same in the three West Coast States. When the West Coast program went into effect every worker, from the low-liest porter to the highest corporation president, was frozen in his job. It applied, whether he was head of a bank or the porter in a hotel. He was frozen in the job in the town where he worked. He could shift to another job only with the approval of the U. S. Employment Service—part of WMC—and his em-

SHEARS



Whichever you want, a straight cut or irregular curve—it's as easy on the inside as the outside, on either flat sheets or formed work. No starting holes needed for an inside cut. A Libert is easy to operate—foot pedal control allows use of both hands to guide work at all times. It shears cleanly! Edges are smooth; need no further finishing. Write for Bulletin.

Made in sizes up to 60-in. throat, 10-gauge capacity

CIRCLE CUTTING
ATTACHMENT
Included 2s Standard
Equipment With
The Machine



LIBERT MACHINE COMPANY

GREEN BAY, WISCONSIN



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What made the West Coast Regional Plan different was the creation of local committees. Local committees were set up in towns and districts composed of business men, physicians, clergymen, and other leaders in the community, whose primary standing was much like that of the draft board. They were volunteers. They knew their communities. It was their task to survey the industries of their communities and to determine who needed more workers first, and who needed them next, and so on. The Committees determined the priorities and bestowed a rating in keeping with the urgency. Each State had an Urgency Committee, the court of final appeal. Meanwhile, the Government had made an inventory of the workers. They were classified by skills and by other qualifications. The U.S. Employment Service kept the records. When time came to apply the priorities those plants or businesses with the highest ratings naturally had first call on the most complete supply of the available workers; those who had the next rating came next; and those who have no ratings obviously must surrender the workers with skill or ability or other qualifications, even if it cuts into their business. Theoretically those without ratings, having neither standing immediately in war production nor in essential civilian service, might even be completely stripped of help. It is quite possible retail establishments might be forced to close because they duplicate or overlap others. It is proposed retail establishments shall cut-back to the status of 1940-41.

This is the West Coast Plan. It seems to work, albeit ponderously. WMC is now fining it down. When it is better formulated and organized it will undoubtedly extend to other regions. It would ap-





reference guide on Lau Single Inlet Blower Wheel and Hub Dimensions—Lau Standard Blower Housing Dimensions—Lau Universal Housings—Lau Wheel Performance Curves from 5" x 2½" to 18" x 9" . . . eleven complete charts compiled in accordance with A.S.H.& V.E. and N.A. F.M. Test Codes. Of particular interest is the Lau Wheel Length Selector Curve. Here's an easy way to select the right air handling equipment, to meet your present war needs for wheels, housings, or complete assemblies. Let this Catalog also be a guide to you in postwar planning.

Send for your Free Copy of Bulletin No. 75

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 The added value you enjoy in SCHAEFER brushes—for any cleaning or service job-comes only from constant research in materials, unequaled knowledge, skill and craftsmanship, and wide experience . . . a combination that provides the "right brush for every task," capable of better work, longer wear, greater brush-value per dollar cost. Prove this to your profit!



SCHAFFER FURNACE BRUSH NO. 5-442

This "Silver Brite" Rustproof Steel Furnace Brush is built for hard work and long-life service. Made of highest quality, special alloy, rustproof spring steel wire, double-twisted flexible wire



SCHAEFER FLUE AND BOILER BRUSH NO. 393

One of the most popular and practical brushes available. Made with oil tempered round steel wire twisted in heavy stem wire and secured in 1/4" threaded nipple.



SCHAEFER CHIMNEY CLEANING BRUSHES

Available in two styles—round type with black tempered round wire, or oblong type with flat tempered steel wire, these chimney brushes are designed for efficiency cleaning and long service. In diameters from 6" to 12".



SCHAEFER "SOLID CENTER" WIRE WHEEL BRUSHES

Designed especially for production buffing and other industrial uses. Heavily filled with crimped steel wire firmly fastened between two steel plates. Available in several sizes, or built to specifications.



SCHAEFER HANDY WIRE BRUSH



· Convenient hand brush for roughing, soldering, and many shop and service uses. Length 6", with tempered steel wire trimmed 1½".

SCHAEFER ACID SOLDERING BRUSH

Practical, handy, tin ferrule acid brushes made of selected black China bristle securely pressed in tin ferrule, for a variety of uses.

Write for complete catalog on Schaefer flue and furnace brushes. or for details on special brushes for industrial use.

SCHAFFER BRUSH MFG. COMPANY

117 WEST WALKER STREET MILWAUKEE 4, WISCONSIN

parently achieve most of the results that would be accomplished under a labor draft law without the odium of the draft law. The core of the whole system is in its negative power. If it cannot force you to do something, it can prevent you from doing the thing that would enable you to accomplish without restraint what WMC seeks to regulate. In a general way the essence of the plan now actively applies to 300 areas scattered around the country.

How to Hold Men You Have

(Continued from page 93)

4. The amount and kind of training needed to train an unskilled worker to do each job.

5. Calls attention to training methods which often result in improved training techniques.

6. Reveals the jobs in which women are employed and also those in which women could replace men.

7. Supplies the information needed for forecasting labor requirements in connection with anticipated production program; e.g., if the output of the plant is to be raised 30 per cent, an accurate estimate can be made of the number and kinds of workers that will be needed to accomplish this increased production.

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8. Often reveals job relationships and suggests a logical chain of promotion or upgrading.

9. Reveals unbalance between number of skilled workers and unskilled, or workers and supervisors.

10. Calls attention to those jobs where physically handicapped or disabled persons can be used.



PENN-AIRE FURNACES

GRAVITY, CAST IRON

Popular Price Practical Design Economical Operation

UNION MANUFACTURING CO., INC. BOYERTOWN, PA.

2. How to Obtain Permission to Participate

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Only those activities which are essential to the war effort qualify for the Manning Table Plan. (Refer to WMC listing of essential activities.) Plants or activities of this class desiring to participate in the Manning Table Plan will fill out WMC Form 500. This form, when filled out, should be mailed to the office of the Regional or Area Director of the Manpower Commission in whose territory the plant or activity is located. If the request is granted, the Director concerned will forward to the company sufficient materials and instructions for compiling five copies of the Table.

Arrangements have been made under which certain national and regional associations are authorized to accept and pass upon the above requests. Applications received at Regional and Area offices from members of association who are authorized to accept and pass upon requests under the foregoing authority will be automatically transmitted to the appropriate office, and the company concerned advised accordingly.

(Information concerning Manning Tables may be secured from any regional or area office of the WMC. In some instances the local offices of the United States Employment Service may have this information. In all cases the local USES offices can tell an employer the proper person to contact regarding Manning Tables.)

A Manning Table may be of little use to a furnace dealer, but any shop manufacturing items will be helped.

3. How to Construct

The first step is that each job must be described accurately by identifying it with the appropriate code

BOOST PRODUCTION SCHEDULES WITH

MARSHALLTOWN THROATLESS SHEARS

CUT ANY SHAPE

CUT ANY SIZE SHEET

Here's just the Shear that offers every feature you want. It does hundreds of odd shearing jobs better and faster—yet is an inexpensive hand operated tool. No matter what type of cutting—either irregular shapes or straight splitting—from ANY size sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.



Get Special Shear Bulletin today. Gives details of sizes from 18 gauge to one-half inch capacity.

MARSHALLTOWN MFG. COMPANY

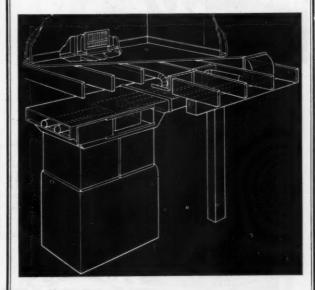
920 E. Nevada St., Marshalltown, Iowa

UNIDUCT SYSTEM

T.M. Registered U. S. Pat. Off.

of installing duct work for forced air heating

NEW in Principle— TESTED in use!



THE patented UNIDUCT System delivers forced warm air through **small** round pipes which are carried **inside** the square return cold air ducts. Actual heating service of the UNIDUCT System in many homes has demonstrated these

PROVED ADVANTAGES

- NO DRAFTS—air movement reduced by long travel from register to outside wall and back to return.
- 2. NOISE REDUCED by changes in pipe size and shape.
- MORE EVEN TEMPERATURES—return air tempered by pick-up of heat from supply ducts—resulting in longer fan operation.
- FLOOR DRAFTS STOPPED where they start—at the outside wall—by UNIDUCT complete mixing of air.
- NO SOILAGE MORE FREE FLOOR SPACE one register for both supply and return air.
- LOW INSTALLATION COST—short runs to inside wall, standard fittings, quick, easy installation.
- SAVING on VITAL MATERIALS—a typical installation package uses only 22½% as much galvanized metal as the conventional installation.
- EASILY BALANCED in one trip—often at time of installation.
- 9. EASILY INSTALLED in OLD HOUSES at low cost.

This packaged duct system will **give you a Big advantage** in competitive Post-War Home Building. WRITE for full details of this revolutionary development in warm air heating.

GENERAL HEATING PRODUCTS CO. 3353 University Ave. S. E., Minneapolis, Minn.





WHILE our production is still 90% war work, various factory adjustments and improvements enable us to now make considerably more warm air furnaces (especially steel) than in 1943.

Our 3 Aims for Helping You:

- By supplying you with all necessary repair parts. (The Government wants repaired all old furnaces which can be repaired.)
- By supplying you regular dealers with as many furnaces as possible.
- By supplying new customers with furnaces if there are enough to go around.

We thank you for your patience in trying times like these, and assure you that we will do everything humanly possible to take care of your 1944 needs.

FRONT RANK FURNACE CO.

2500 OHIO AVE., ST. LOUIS 4, MO.

reference from the Dictionary of Occupational Titles, or a complete individual job description prepared by the plant or activity. (See typical table illustrated for a "job description.") Their use will save a great deal of time and energy in the preparation of the Manning Table and will also be of assistance to WMC in the review of these tables.)

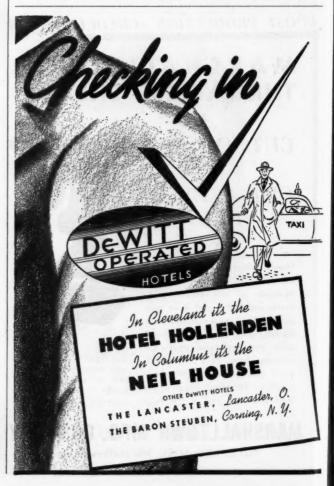
Next, duplicate jobs are counted and the number indicated. Thus a department might have 307 workers but only 7 jobs. Each job is listed separately. The number of workers employed on each job is given, and it is indicated whether these workers are male or female. If no women are now employed, there is a space provided to indicate whether or not women workers might be substituted. The male employees are shown according to age groups of fixed intervals and whether they are single or married.

Certain other information is supplied by the Manning Table, such as the time required to train new workers, the jobs that are filled by handicapped persons, and the number of additional employees needed.

Manning Tables will be kept current by periodic review once each six months, and by special review at such other times as the personnel requirement picture of the activity is substantially changed, as, for example, an increase in or cancellation of war contracts, etc. This will be accomplished by "Reports of Changes in Manning Tables," forms and instructions for which will be furnished in due time.

4. How Submitted and Reviewed

Representatives of the Federal Committee on Apprenticeship, U. S. Department of Labor and the War Manpower Commission advise that all shop employees are sheet metal mechanics of varying degrees of skill.



The welder, the man on the power brake, on power rollers, etc., require a background of sheet metal training in order to properly meet the requirements of their work. In few instances are these men working exclusively on these machines but generally change around to other work in the plant when caught up with the necessary machine work.

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Without a recognized apprentice training plan, all men not journeyman sheet metal workers, are helpers and as such are construed by Selective Service to be replaceable in six months. With a proper apprentice training plan in operation, the replacement requirement for each apprentice is the total time served up to the point where he becomes a journeyman. For instance, a man who had served three years and nine months in one of our shops would not be considered replaceable under approved apprentice training in less than three years and nine months, while as a helper he would be replaceable in six months.

When the Manning Table has been drafted by the plant it will retain one copy and forward the four others to the Office of the WMC Regional or Area Director. The Regional or Area Director will arrange for the review and acceptance of the Manning Table and will advise the plant or activity concerned of any additional action required of it.

The Regional or Area Director will retain one copy of the Manning Table; will forward the second copy to the State Director of Selective Service in whose state the plant is located, and after review the third copy to the Washington Office of the War Manpower Commission. The fourth copy will be sent to the Director of the United States Employment Service in whose area the plant is located.



MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR

NEWARK, OHIO



Large Capacity Blowers

for heavy duty installations are designed and constructed by Brundage to meet the need of factories, schools, public buildings, churches, apartments and clubs. Capacities up to 30,000 C.F.M.

... little ones



ASK YOUR JOBBER OR WRITE DIRECT TO

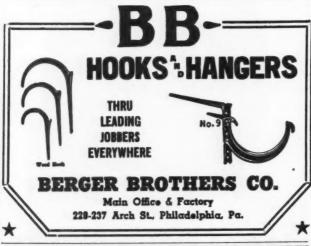
The BRUNDAGE CO.

BLOWER SPECIALISTS

KALAMAZOO

MICHIGAN





PARTS REPAIR

for any and all makes of

STOVES—FURNACES—BOILERS

Also MODERN AIRE FURNACES

Fittings, Registers, Supplies

DES MOINES STOVE REPAIR CO.

Sam C. Green Fred R. Green

DES MOINES, IOWA Since 1869

5. How the Manning Table Works in Connection With Selective Service

When a Manning Table has been drafted by the employer, he should then proceed to draw up a "Replacement Schedule" in accordance with the Replacement Schedule Plan (outlined previously).

The Replacement Schedule consists of a plant summary and replacement list and is normally made from data developed in preparation of the Manning Table. However, the Replacement Schedule may be prepared independently of a Manning Table if authorization is received from the appropriate regional director of the War Manpower Commission. It should be noted, however, that the regional director may subsequently require the development of a Manning Table. In any case where it appears advisable, a Replacement Schedule may be accepted by Selective Service for immediate operation without a Manning Table. If an employer has in operation a Replacement Schedule and subsequently prepares a Manning Table, the State Director of Selective Service may require the employer to prepare a new Replacement Schedule immediately or permit the employer to continue under the Schedule then in operation until the end of the sixmonth replacement period.

Sell **Barometric Dampers**

(Continued from page 142)

with a tile lining. Hence, the intensity of the draft created at the base of the chimney was probably great-

SPOT WELD WITH AN

ACME "Hot Spot" WELDER

Proven utility for over 26 years in thousands of sheet metal fabricating

Write for Literature and Prices.

Complete Range of Sizes Lifetime Guarantee!

ACME ELECTRIC WELDER CO. 2618B Fruitland Road Los Angeles, Calif.

FEW AS

Stokers **Handy Fittings** Repairs

GOOD



BETTER

Blowers **Rock Island Registers Humidifiers**

All genuine Gilt Edge repairs carry a label saying "Genuine Gilt Edge Part." We have genuine Gilt Edge repairs for Gilt Edge Hummer, Gilt Edge Crescent, Gilt Edge Radium, Gilt Edge Badger, Gilt Edge Liberty, Gilt Edge Solar, Gilt Edge Fireside, 500, 600, 700, 800

CHWAB FURNACE CO.

and 900 Series Furnaces and Gilt Edge Round and Square Boilers. We are successors to the Schwab & Sercomb Co., R. J. Schwab & Sons Co., and the Schwab Furnace & Mfg. Co. Buy from jobbers who carry genuine Gilt Edge repairs or write us. We can furnish a Gilt Edge Furnace on the proper priority.

193 SOUTH SECOND STREET MILWAUKEE, WISCONSIN

er than that ordinarily found in unlined and less substantially constructed chimneys. In installations in which the draft normally created by the chimney is comparatively small, the fuel saving that could be effected by the use of an outdoor air supply to the draft regulator would probably be less than that obtained in the Research Residence. On the other hand, for installations which are located in regions of high wind intensity, the draft created by the chimney might be greater, and the saving effected by the use of an outdoor air supply to the draft regulator might be larger than that obtained in the Research Residence plant.

"Conclusion.—The following conclusion may be drawn from the test data:

"(1) A fuel saving of approximately 5 per cent may be effected by supplying air from outdoors to an automatic draft regulator instead of supplying the air from the basement."

Nothing is said in these three reports about the turn damper used in conjunction with a barometric damper. However, most of the manufacturers of barometric dampers recommend the turn damper being removed so that there will be no possibility of its choking the smoke pipe. The barometric damper will maintain the proper draft. There might be chimneys with such a strong draft that both turn and barometric dampers are needed-but such chimneys certainly would be exceptional.

Most of the barometric damper manufacturers also recommend permanently closing the check damper and disconnecting it from the chain, when the chimney draft is excessive. Certainly a check damper will have little use with a stoker or oil burner-what to do in a hand fired coal plant must be determined from observation on the job.



WILL

WILLIE

WILLIAM

BILL

4 Little "Fitting" Guys Fighting For You!

Will cuts installation costs-

Willie makes fittings fit-

William keeps prices down to bed rock-and Bill sees that there is a stock near you.

FLASH NEWS! Complete, simplified line Gravity Pipe and Fittings now available on rated orders-24 hour service and shipments.

FREE: Complete, easily understood gravity pipe and fittings catalog showing full simplified line. Write Dept. 2 for prices and catalog.

THE WILLIAMSON HEATER COMPANY CINCINNATI 2, OHIO



ROCK ISLAND REGISTER COMPANY

2435 Fifth Avenue

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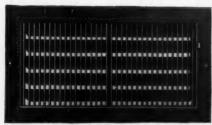
1944

Manufacturers of

Rock Island, Ill.

-AIR-VANE and BENDA-VANE Air Conditioning-

Registers, Intakes and Grilles



AIR-VANE REGISTERS

Rock Island Air-Vane Registers are bar type fabricated construction, vertical or horizontal vanes. Vanes are spaced 11/32" apart and can be adjusted to any desired angle of deflection from 1 to 45. Single Valves and Sponge Rubber Gaskets are standard equipment on all Air-Vane Registers. Also available with Multi-louvre Dampers.
AIR-VANE Sidewall and Baseboard Registers

are made and carried in all standard pipe sizes; also available in larger sizes as wall registers, wall registers, wall grilles and double deflection grilles.

Out-O-Wall



Inset below shows simple adjustment of vanes with special tool furnished.

NO-STREAK and OUT-O-WALL REGISTERS

For Gravity Lines. Available in standard sizes; also in narrow floor projections for second floor stacks; also Forced Air Sizes.



BENDA-VANE REGISTERS

Benda-Vane Registers are made in Single Valve and Multi-Louvre types. Available in sizes for all standard Forced Air and Gravity Size Registers.

Above, and Floor and Ventilating Registers and Grilles in several designs and styles.

COMPLETE CATALOG INFORMATION ON ALL PRODUCTS FURNISHED ON REQUEST.



No. 200 Series-No-Streak Bar Design, First Floor One Way



SAVE ON MALLET COSTS with the DENSEWOOD

Here's a mallet that lasts longer under hard use, does better work
—at less cost. It's the DENSEWOOD, made of "condensed" wood, tough, yet resilient, non-splitting, and MANY TIMES stronger than ordinary wood. You'll call it your favorite tool on all sheet metal work. Precision-balanced "lockwedge" handle never loosens. metal All sizes and types.

Save money! Put DENSEWOOD on YOUR job. Write for details and prices.

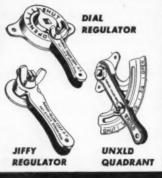
DENSEWOOD CORPORATION ELKHORN, WISCONSIN

For New Installations and Repair Work... RUBYFLUID



A Type And Size For Every Need

For efficiently controlling light and medium dampers in heating, ventilating and air conditioning systems, specify Parker-Kalon Damper Controls. The line includes all types and sizes, at a range of prices to fit the needs of any job. Parker-Kalon Corp., 190-192 Varick Street, New York.



PARKER-KALON damper controls

McGrath New Williamson President

At a meeting of the Board of Directors of The Williamson Heater Company, W. L. McGrath was elected president to fill the vacancy created by the death of the late W. C. Williamson. Mr. McGrath has served as executive vice-president for the past ten years and has been connected with the corporation since 1920.

In addition to his activity with Williamson, Mr. McGrath is a nationally known authority in the heating industry. He served as president



of the National Warm Air Heating and Air Conditioning Association for two years and was head of the Code Authority of NRA for the furnace industry. Since 1940 he has been a member of the Plumbing and Heating Advisory Committee for WPB and is chairman of the Furnace Manufacturers Sub-Committee for the same authority. In 1942 he was employed as consultant to WPB.

Under Mr. McGrath's direction, The Williamson Heater Company has developed a nation-wide sales and service organization and has been active in the industry in the development of modern heating equipment.

Another new departure for the company will be the manufacture of a line of steel warm air furnaces in addition to its cast units.

As one of the country's early advocates of multiple management, Mr. McGrath installed this democratic system of business operation in The Williamson Heater Company about six years ago. As a result, the company has been nationally recognized as an outstanding example of employee participation in industrial enterprise.

PORTLAND • SAN FRANCISCO • LOS ANGELES
SALT LAKE CITY • DENVER • EL PASO

HAROLD W. WINNINGHAM & COMPANY "WINCO"

Western States Representatives and Engineers for National Manufacturers

HEATING-AIR CONDITIONING-APPLIANCES CONTROLS AND GENERAL EQUIPMENT

GENERAL OFFICES

1117 SECOND AVENUE AT SENECA SEATTLE I, WASHINGTON

SOUTHWEST DISTRICT OFFICE: 633 So. La Brea, Los Angeles Lawrence J. Coman, Manager

"Serving the General Distributors and Jobbers of the West"

Years of Experience in Building

Handled exclusively through established dealers

An Ideal FIRST for Dealers with whom LASTing quality is important ALWAYS, on every job!

Majestic FURNACES For Better Heating!

The Majestic Co., 909 Erie St., Huntington, Ind.

Ebbert Joins Grant Wilson

J. Harry Ebbert, who recently resigned as vice-president and general manager of the Armstrong Company, manufacturers of asbestos furnace and refractory cements, has been elected vice-president of Grant Wilson, Inc., 4101 West Taylor St., Chicago. He will make his headquarters in the Chicago general offices.

Mr. Ebbert, during the last 15 years, has served as manager of the Armstrong Chicago and Dallas plants and

more recently as vice-president, directing the Company's sales, research and production from their Detroit offices.

The new activities of vice-president Ebbert will include sales direction and an active participation in the Company's post-war planning and the development of new markets for the many new asbestos and insulating materials now offered by the Company.





WANTED-Old Red Streakswe will buy any old Red Streak. If you know one for sale by all means tell us—

When the WPB stopped our production of new Red Streaks provision was made Streaks provision was made for the maintenance needs of all Red Streak Super Furnace Cleaners. You can get hose, bags, fans—most needed parts. Including complete chimney cleaning equipment, and all counsel and suggestion we can give. Write

FRED BISSELL, formerly president of The National Super Service Co. 1944 No. 13th St., Toledo 2, Ohio

Cut Sheet Metal "Easy as Pie"

with Black & Decker Lectro-Shears

Lectro-Shears cut straight lines, irregular patterns or curves down to ¾" radius. Cutting operation always visible. Two models, 18 and 16 gauge, cut up to rated capacity in steel, 50% more in non-ferrous metal. Universal motors. See your Black & Decker Distributor, or write to: The Black & Decker Mg. Co., 782 Pennsylvania Ave., Towson 4, Maryland.



DRILLS, HOLE SAWS, DRILL STANDS, LECTRO-SHEARS, BENCH GRINDERS, SANDERS, PORTABLE GRINDERS.

WAYNE IL.FIRED



FURNACE UNITS

60,000 to 400,000 B.T.U.

PROMPT SHIPMENT on proper priority

The complete line of Wayne oil-burning furnaces and burners is again available.

WAYNE OIL BURNER CO., 911 Glasgow Avenue Fort Wayne 4, Indiana

WAYNES V-DAY LINE COMPLETE

OIL-FIRED, GAS-FIRED, COAL-FIRED FUR-NACES, STOKERS, BOILERS, WATER HEATERS. CONVERSION BURNERS FOR OIL AND GAS.

LINE UP WITH WAYNE FOR POST WAR PROFITS



SAVES CLEVELAND FIRM 75% IN WELDING TIME

Instead of welding 4 individual spects on this welded job the older way, Harris Products Co., Cleveland manufacturers of vibration insulatars, installed a special prejection welding die, making it possible to speed production by 4 times the former rate. Perhaps you, too, can profit by adapting projection welding techniques to your work and by using the improved Model J Spet and Prejection Welders. Designed for general work, these models contain several new features not found in resistance welders self-ing for far greater prices. Write taday, telling us your problems. We will offer our best possible help at no celligation.

MULTIPLE SPOT WELDING

Assembly, made possible a welding rate 4 times greater than could have been reached by Individual welds. A special die, designed to weld points i, 2, 3, and 4 (above) at one contact made this possible. The older way would have to weld point i, turn the piece, weld point 2, turn the piece again, etc.

PROJECTION WELDING ON UNIVERSAL WELDERS

is a more efficient way to meet schedules. You get more uniform welds from these rugged, simply constructed welders. Use current economically, "Green help" produces uniformly good welds on the Model J Spot Welder.

Send Coupon Today



UNIVERSAL

UNIVERSAL POWER	CORP., 4898 Euelld	Ave.
Cleveland 3, Ohio. Please send complete jection Welders and help me.	stery on your Spet accessories and how	

NAME ADDRESS

CITY..... STATE.....



REPAIR PARTS FOR ANY **FURNACES-BOILERS**

OR STOVES Complete Line of

Sundries and Supplies FOR QUICK SHIPMENT

OMAHA STOVE REPAIR WORKS

1206-8 DOUGLAS ST., OMAHA 2, NEB.

SINCE 1882



Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for litera-ture showing complete line.

ALL-ALLOY No. 2 cuts up to 1/4" steel plate. ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be obtained for shearing stainless steel

BREMIL MFG. CO., ERIE, PA.

is the name to remember

for oil burners . . . oil-designed furnaces and boilers that assure you of:

- J Satisfied, loyal customers

- J Design features that sell
- ✔ Profitable manufacturer-dealer relations



GRAYS FULL SIZE BLUE PRINT PAT-TERNS ARE A GREAT TIME SAVER

SHIP VENTILATOR PATTERNS From 4" to 48" dia. of base, in sets and single

ELBOW PATTERNS IN TWO SETS

Set No. 1—1" to 20", in 2-3-4-5-6-7-piece, including T Patterns, 2" to 20"—152 Patterns. \$2.50

Set No. 2—20" to 40", in 5-6-7-8-9-piece, 105

Patterns, including elbow chart, showing what pattern and number of pieces for required angles, also gives the distance between seams in throat for any required radius up to 96". With the two sets is included a circumference chart showing every 1/8" up to 96" dia.

Sets No. 1 and No. 2, postpaid.......\$5.00

G. L. GRAY, 509 GRAND AVE. NEW HAVEN, CONN. Mention American Artisan

WAR T

American Air Filter Co., Inc., Louisville 8, Ky., reports 148 men lost to the armed services. Most of their executives and engineers are over the age limit or have been deferred.

The company is building subassemblies for LST craft amounting to about 400 tons per week; carburetor fittings for airplanes; dust control for war plants; Roto-Clones for Tank ventilation; and several "hush-hush" projects. All present business consists of war orders.

The company has added Plant No. 3.

All employees are purchasing 10 per cent of their salaries in war bonds. Two former employees have been lost-one at Casablanca and the other in the South Pacific. Vice President H. C. Murphy's son Robert is a navigator in the AAF. South Pacific, and was recently awarded the Flying Cross.

We all wish it was over so that we can get our boys home and go back to work on a peace-time basis.-J. R. McConnell.

Payne Furnace & Supply Company, Inc., Beverly Hills, California, reports the following in Government service:

Henry Pitman, Mgr. Dallas Office, Army Camp Mechanical Engineer.

Robert Van Brunt, Mgr. Memphis Office, Army Camp Heating Engineer.

John Mueller, Chief Engineer Laboratory, Major in Engineers Corps somewhere in Alaska.

Kenneth Hogan, Factory Foreman, Marines.

W. R. Campbell, Factory Foreman, Army.

Gordon Payne, Personnel Manager, Army.

The company has many sub-contracts and several prime putreets of a rather secret nature, dealing with photographic

contracts of a rather secret nature, dealing with photographic supplies and Army Ordnance equipment. Present business is all war orders.

In 1941, approximately fifty per cent additions were made to plant to supply Army and Navy Cantonments and construction of heating equipment-now entirely engaged in war work.

Employees, under the payroll deductions plan, have earned the Minute Man Flag, and the company has purchased \$100,-000 worth of bonds.

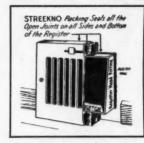
With 116 stars in the service flag, unquestionably many have seen service in all theatres. Details are lacking on many of them.

The Assistant to Vice-President and General Manager has been serving on various government committees, including the original Plumbing and Heating Industry Advisory Committee and the Warm Air Heating Industry Advisory Committee of War Production Board and Warm Air Heating Industry Advisory Committee, recently formed by OPA.— E. L. Payne, V.-P. and Gen. Mgr.

Myrtle Groomes, private in the Marine's Woman Reserve, is at Camp Elliott, California, in Post Exchange. Miss Groomes has been in the service since July, 1943, with boot training at Camp LeJeune, New River, N. C., and went from Camp LeJeune to Camp Elliott.

Miss Groomes is the daughter of Forest Groomes of the Sheet Lock Company, Chicago.

KEEP A FULL FORCE WORKING!



Keep all your men on full time working schedules by having them install Streekno in all your warm air heating jobs. Streekno saves hundreds of dollars in dec-orating, eliminates dirt streaks above and around registers.

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Millions of home owners want it. It sells for only \$2.00 and you make a big profit. Don't lose men in the slack season.

Write today for complete de-tails about merchandising help and a STREEKNOTIZING cam-paign of your own.

EXCEL HEATING & AIR CONDITIONING CO. 3715-19 Belmont Ave., Chicago 18, Ill.

TRADE NEWS \Leftrightarrow

Formal presentation of the Army-Navy "E" award was made to the employees of the Conco Division of H. D. Conkey & Company, Thursday, November 18, 1943, at their plant in Mendota, Illinois.

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Conco war production includes cranes, hoists and trolleys for war plants; draft controls, Marine Corps wrecking truck hoists, and "Blitz" cans.

Condensation Engineering Corporation, 2515 S. Archer Ave., Chicago, is producing Vitroliner almost exclusively for the Army and government war housing. The demand and acceptance by the government has brought the Vitroliner from the stage of development to that of a widely accepted commodity. This will be of interest to the manufacturers of warm air heating equipment because of the improved efficiency when used in conjunction with their equipment. It also puts the chimney business in the sheet metal field.

The Auer Register Co., Cleveland, Ohio, has made quite a number of Army tank parts for prime contractors. In the early part of 1943 the company tooled up for a fair sized program of airplane parts and has orders ahead for approximately six months. Approximately ninety per cent of this figure varies from month to month and from all indications

should hold rather constant for the next three or four months.

The airplane parts being made amount to considerable volume. The company is able to fill most register and grille orders even though slow on deliveries, as it is mandatory to keep on schedule with the airplane parts-H. G. Curtis.

United States Air Conditioning Corporation, manufacturers of cooling, heating, ventilating and humidifying apparatus, northwestern terminal, Minneapolis, Minn., reports—most of its personnel have gone into the "air" service.

Latest additions to the officers recently commissioned by the Army Air Corps are the following:

David Feinberg, 2nd Lt., is the son of General Manager and President Albert A. Feinberg.

Roy Kucera, Flight Officer, U. S. Army Air Corps, is a former member of the U. S. Airco organization and a brother of Chief Accountant, George F. Kucera.

Francis Raitt, 2nd Lt., U. S. Army Air Corps, entered the service in 1942, and prior to that time was a member of the U. S. Airco home office organization.

Deb Mead, Seattle sales representative, is now Pfc in Army.

Between sixty and seventy U. S. Airco employees are at this time spread out among the Army, Navy and Air Services.

The company has contracts for centrifugal blowers for the U. S. Navy and Maritime Commission, and evaporative coolers, blowers, coils, and air washers, for the U.S. Army.

About ninety per cent of the business is for Navy, Maritime Commission and Army, and ten per cent for essential civilian. Orders are AA5 or higher.

Ten per cent bond purchase plan has been in effect since January 1, 1942. General Sales Manager B. P. Edelman has been a district supervisor in the two city-wide bond drives.





Chisels, punches, drills, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.

DAMASCUS STEEL PRODUCTS CORP., ROCKFORD, ILL.

REMEMBER THE NAME HOT BLAST D

FOR A COMPLETE LINE OF GAS AND OIL-FIRED FLOOR FURNACES

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Dervice Section

Accurate Revolving Ventilators

STILL BEST for installa tion on chim neys, espe cially chim neys of fire places, and oil or gas fired heating systems where down drafts are common BEST for Poultry houses and brooder stoves. LOW COST Made in size

inch.



and Larger with Louvers Patent No. 2018020

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ACCURATE MFG. WKS. 2336 Milwaukee Ave., Chicago 47, III.

WRITE US FOR JOBBERS SET UP

TOOLS for the ROOFING CONTRACTOR

ASBESTOS SHINGLE CUTTERS

AXES

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BROOMS BUCKETS

CALKING GUNS CALKING CEMENT HOOKS INSULBRIC KETTLES KNIVES LADDERS LADDER JACKS

KNOT BRUSHES

HATCHETS

HOISTS—PORTABLE HOISTING WHEELS

MOPS: FREY PATENT CABLE CORD SOFT YARN

MOP BELLS MOP HANDLES NAILS, CONCRETE ROPE SCRAPERS SLATERS' TOOLS TROWELS WHEELBARROWS

FRANK P. FREY & CO.

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Maximum power, minimum effort.

Combination, Right and Left, No. 185-199-195.

Blades made from alloy steel. Hardened and tempered for rough use. Will cut with ease all grades of steel. Side locking feature that will not interfere with cutting blades.

Case hardened bolts IMMEDIATE DELIVERY Write for Circular

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Drill Concrete with the "De-All" nation Electric Hammer and Drill bolts 10 to 20 times faster than ' Drills concrete, brick, stone, metal maintain. Weighs 15 lbs. Drills crete. 2400 blows per min. Bulle crets. 2400 Bass. Austin 9868. WODACK ELECTRIC TOOL CORPORATION 4544 W. Huren St., Chicago, III.

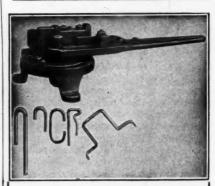
WELDING HEADQUARTERS





eld from a watch case to a deor. Special mard SPOT WELDERS from 1/4 to 500 K.V.A. Are Welders from 100 to 400 Amps. We invite act Spot Welding in large or small quantities

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L. R. EVANS MACHINE COMPANY SANDWICH, ILLINOIS

YAGER'S Soldering Salts - Paste

Two standard fluxes for all seft seldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.

1/2 lb., 1 lb., 5 lb. sams; 2 ez., 6 ez., 12 ez.

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USE VERNOIS PARTS IN Vernois FURNACES .

Every part of every Vernois Furnace is engineered and built to fit and function perfectly. Buy and install only Vernois parts for Vernois Furnaces. That's the way you get continued high efficiency from Vernois installations. Order them direct.

MT. VERNON FURNACE & MFG. CO.

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HIGH RATING .



The new V-Vent ventilating unit has a high rating for exhaust efficiency. It is sturdy, skillfully designed, built of non critical materials. Guaranteed by Dickinson to provide high efficiency at moderate cost. Write for further details.

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3320 S. Artesian Ave.

Chicago 8, III.



CHAMPION DRAW PIPE CRIMPER

Length—14 Inches
Weight—one lb. 10 ozs.
Crimps plain round, square and rectangular pipe—quickly, perfectly and easily. Can be used in the shop or carried conveniently in the tool kit-to outside jobs. Appreciated by those who install warm air furnace pipe, wall stacks, air ducts, smoke, conductor and water heater vent pipe, etc. Price \$2.50 f. o. b. Factory.

Jobbers and January

Factory.

Jobbers and Installers:

Write for full details today

CHAMPION TOOL COMPANY

176 West 41st Place, Les Angeles 37, Calli

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Classified Section: Rates for classified advertising are 5 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. Cash must acompany order.

WANTED:

ONE ROTEX PUNCH NO. 10 OR NO. 18 NEW OR USED

MUST BE IN GOOD CONDITIONING.

WRITE A. D. H. CO. P. O. Box 1411, Salinas, California

25

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N. Y.

, 1944

BUY MORE WAR BONDS

Grand Rapids Furnace Cleaners

conserve heating plants fuel — and — man hours.

Write for Details



DOYLE VACUUM CLEANER COMPANY

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QUICK DELIVERY

BRAKES

POWER: 10'10 ga., 8'14 ga., 6'12 ga., 6'14
HAND: 8'18, 6'18, 8'16, 5'20, 4'20 ga.
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36", 30", 20" PEXTO & NIAGARA.
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UNIVERSALS: No. 2 B&S: Nos. 1 & 2
KEMP, No. 1½ HENDEY NORTON.
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No. 56 NIAGARA, ½"x½";
No. 40 WHITNEY, 5/18" thru ½".
DEEP THROAT: No. 15 TOLEDO; No. 20
EXCELSIOR, No. 135-A NIA.
PRESS BRAKES

8"11 ga. CINCINNATI, 5'14 ga. OHL.
CHICAGO STEEL: Nos. 335, 255, 254.

SEND FOR CATALOG

POWER: 12' HILLES JONES, %" capacity.
ANGLE: 6"x6"x%" WICKES.
LEVELLER: 5' NILES, 7 Rolls, 6%" Dia.
SHEARS

48" 10 ga. BERTSCH, 18" gap; 8' %"
STOLL, 18" gap; 62"16 ga. KUTSCHEID,
10'16ga. & 10' 3/16" OHL.
FOOT: 36" & 30" PEXTO & NIAGARA.
3'20 ga. PEXTO.
36" NIAGARA with curved blades.
RING & CIRCLE: No. 510 Niagara %"
cap., back geared, motor driven.
QUICKWORK, 5/22" shear, %" flang.
ROTARY: 14 ga. QUICKWORK & YODER.
SPOT WELDERS
250 KVA FEDERAL PRESS TYPE.
20 & 30 KVA GIBB PRESS TYPE.
21' & KVA IDEAL; 10 KVA TAYLOR.
MISCELLANEOUS ITEMS
No. 737 PEXTO FOOT NOTCHER.
No. 0 GRAY NIBBLER, %" cap.

CO., INC. YARD5 5800

MACHINERY CO., INC. YARDS 5800

"CENTRAL-WEST" can furnish your Sheet Metal Machinery Requirements

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LOCKFORMERS . • 'Pexto' Shears, Folders, Rolls, Rotary Machines, Etc.

• Electric Shears, Drills Shop Tools Whitney Tools - Smith Cleat Benders -

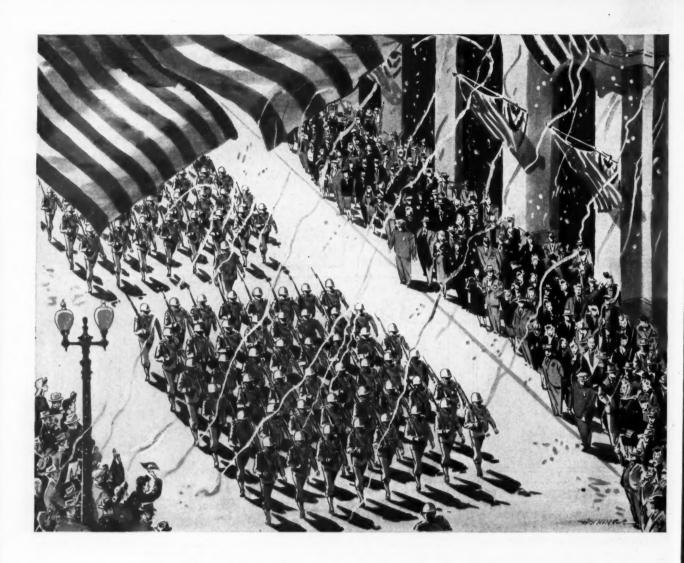
Complete Line of Sheet Metal and Ventilating Supplies FRED E. MILLER—"Always Ready to Serve You"—N. A. LINDVALL

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Haymarket 8361

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When the War is Over

War with its urgent need for faster and better production has challenged our facilities. *\(\pi\) We have always prided ourselves on our ability to produce the best in heating equipment and even while devoting our efforts to the demands of war we are acquiring new information and skills which will enable us to improve our products. *\(\p\) When the war is over we will be in a better position to serve our dealers than ever before.



Section of

JANUARY, 1944

AMERICAN ARTISAN

1944 DIRECTORY

OF WARM AIR HEATING, RESIDENTIAL AIR
CONDITIONING AND SHEET METAL PRODUCTS

Section 1.-Products Classified . . . Page 228

If you want to know the names of one or more manufacturers making a certain product, look in Section I, where products are classified alphabetically in directory style with the noun governing (for instance, Warm Air Furnaces are listed as Furnaces, Warm Air).

Section 2.-Trade Names Page 281

If you have the trade name of a product and want to know who manufactures it, look in Section 2, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be readily identified under their product classifications in Section 1.

Section 3. – Manufacturers' Addresses . Page 301

For the complete name and address of any manufacturer, look in Section 3.

• The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, page 314, for the page on which you will find the advertising of any of these manufacturers.

41

Section of

American Artisan

1944 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

Section 1-PRODUCTS CLASSIFIED

 The manufacturers whose names are dotted throughout the listings advertise their products in this issue. Turn to Index to Advertisers, page 314, for the page on which you will find the advertising of any of these manufacturers.

ADSORBERS, ODOR

Betz Corp., Hammond, Ind. Carbide & Carbon Chemicals Corp., New York City. Connor Engineering Corp., W. B., New York City.

AIR CONDITIONING FURNACES

See Furnaces, Warm Air, Air Conditioning

AIR CONDITIONING UNITS, CENTRAL PLANT, SUMMER

(Self-contained fan, filter and cooling coil unit for connection to refrigerating compressor or cold water supply with duct distribution of air)

Air Conditioning & Refrigeration Div., Worthington Machinery Corp., Harrison, N. J.

Air & Refrigeration Corporation, New York City.

Airtemp Division, Chrysler Corp., Dayton, O.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

American Blower Corp., Detroit, Mich.

Bahnson Co., Winston-Salem, N. C.

Baker Ice Machine Co., Inc., Omaha, Nebr.

Beacon-Morris Corporation, Boston.

Betz Engineering Co., Kansas City, Mo.

Blower Application Co., Milwaukee.

Buffalo Forge Co., Buffalo.

Carrier Corp., Syracuse, N. Y.

Clarage Fan Co., Kalamazoo, Mich.

Conditionaire Unit Co., Chicago.

Curtis Refrigerating Machine Co., St. Louis.

Drayer-Hanson, Inc., Los Angeles. Air Conditioning & Refrigeration Div., Worthington Pump &

Prayer-Hanson, Inc., Los Angeles.
Fedders Mfg. Co., Inc., Buffalo.
Forman Air Conditioning & Eng. Co., New York City (freon).
Frigidaire Division, General Motors Corp., Dayton, O.

General Air Conditioning Corp., Cincinnati.

General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit,

Wis.
Governair Corp., Oklahoma City, Okla.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Howe Ice Machine Co., Chicago.

Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kennard, Sam, Inc., St. Louis.
Kramer Trenton Co., Trenton, N. J.
Lennox Furnace Co., Marshalltown, Ia.
McCord Radiator & Mfg. Co., Detrolt.
McQuay, Inc., Minneapolis. McQuay, Inc., Minneapolis.
Marlo Coll Co., St. Louis.
Micheli Air Conditioning Co., Inc., Schenectady, N. Y

Nelson Corporation, Herman, Moline, Ill.

Niagara Blower Co., New York City.
Pernot & Rich, Inc., Los Angeles.

Premier Furnace Co., Dowagiac, Mich.
Refrigeration Economics Co., Inc., Canton, O. Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis
Blow Pipe & Heater Co., Inc., St. Louis.
Stainless & Steel Products Co., St. Paul, Minn.

Sturtevant Co., B. F., Boston.
Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
U. S. Air Conditioning Corp., Minneapolis.
United States Radiator Corp., Detroit.
Vilter Manufacturing Co., Milwaukee.

Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

X L Refrigerating Co., Inc., Chicago. York Corp., York, Pa. Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, CENTRAL PLANT, WINTER, SPLIT SYSTEM TYPE

(Self-contained fan, filter, humidifier and heating coil unit for connection to steam or hot water boiler with duct distribution of air)

Air Conditioning & Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
Air & Refrigeration Corporation, New York City. Airtemp Division, Chrysler Corp., Dayton, O. Aladdin Heating Corp., Oakland. Calif.

Aladdin Heating Corp., Oakland. Calif.
Allis-Chalmers Manufacturing Co., Milwaukee.
American Blower Corp., Detroit.
Bahnson Co., Winston-Salem, N. C.
Beacon-Morris Corporation, Boston.
Betz Engineering Co., Kansas City, Mo.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Fedders Mfg. Co., Inc., Buffalo.
Fitzgibbons Boiler Co., Inc., New York City.
General Electric Co.. Bloomfield, N. J.
Handelan Washed Air Co., Minneapolis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Johnson Co., S. T., Oakland, Calif.. and Philadelphia.
Kauffman Air Conditioning Corp., St. Louis.
Kennard, Inc., Sam, St. Louis. Kennard, Inc., Sam, St. Louis. Kramer Trenton Co., Trenton, N. J.

Kramer Trenton Co., Trenton, N. J.
McQuay, Inc., Minneapolis.
Marlo Coil Co., St. Louis.
May Oil Burner Corp., Baltimore.

Mayflower Air Conditioners, Inc., St. Paul.
Michell Air Conditioning Co., Inc., Schenectady, N. Y.

Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Niagara Blower Co., Chicago.
Niagara Blower Co., New York City.

Penn Boller & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Economics Co., Inc., Canton, O.
Richmond Radiator Co., Inc., Uniontown, Pa.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe
& Heater Co., Inc., St. Louis.
Stainless & Steel Products Co., St. Paul, Minn.

Surface Combustion, Toledo, O.

Stainless & Steel Frounds Co., St. Faul. Minn.

Surface Combustion, Toledo, O.

Trane Co., La Crosse, Wis.

U. S. Air Conditioning Corp., Minneapolis.
United States Radiator Corp., Detroit.
Western Blower Co., Seattle, Wash.

Williams Oil-O-Matic Heating Corp., Bloomington, Id.

Wood Industries, Inc., Gar, Detroit. York Heat Div., York-Shipley, Inc., York, Pa. York Corporation, York, Pa. Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, EVAPORATIVE TYPE, SUMMER

(For cooling with sprays, no dehumidification)

Air-O-Line Co., The, Dallas, Tex. Air & Refrigeration Corp., New York City. American Blower Corporation, Detroit. American Cooling Tower Co., Kansas City. American Metal Products, Fort Worth, Tex.

• Advertisement in this issue. See Index to Advertisers, page 314.

FSS

AIF

All

Br Ca Ca Dr • Ge • Ila Ka

April Showers Co., Washington, D. C. (Roof Spray) April Showers Co., Washington, D. C. (Roof Spray)
Aqua-Mist Co., Topeka, Kans.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Bien Air Conditioning Co., Los Angeles.
Bahnson Co., Winston-Salem, N. C.
Campbell Heating Co., E. K., Kansas City.
Carrier Corporation, Syracuse, N. Y.
Dallas Engineering Co., Inc., Dallas, Tex.
Economy Electric Manufacturing Co., Cicero, Ill.
Electropas Europas Co., San Francisco. Electrogas Furnace Co., San Francisco. Essick Manufacturing Co.. Los Angeles. Essick Manufacturing Co., Los Angeles.
Farr Company, Los Angeles.
Great National Air Conditioning Corp., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver. Colo.
National Engineering & Manufacturing Co., Kansas City.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Palmer Manufacturing Corp., Phoenix, Ariz.
Pernot & Rich, Inc., Los Angeles.
Reynolds Manufacturing Co., Springfield, Mo.
Royal Air Conditioning Equipment Co., Alhambra, Calif.
Shreveport Eng. Co., Inc., Shreveport, La.
Spray Wheel Air Conditioners, Inc., Denver, Colo.
U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Western Blower Co., Seattle, Wash.
X L Refrigerating Co., Inc., Chlcago.

AIR CONDITIONING UNITS. ROOM TYPE. SUMMER, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

(Self-contained blower, coil, filter unit for connection to remote compressor or cold water supply)

compressor or cold water supply)

Airtemp Division. Chrysler Corp., Davton, O.
Carrier Corp., Syracuse, N. Y.
General Air Conditioning Corp., Cincinnati.
General Electric Co., Bloomfield N. J.
Giant Mfg. Co., Council Bluffs, Ia.
Hastings Air Conditioning Co. Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Kauffman Air Conditioning Corp., St Louis.
Kennard, Inc., Sam, St. Louis.
King Ventilating Co., Owatorna, Minn.
McQuay, Inc., Minneapolis.
Marlo Coll Co., St. Louis.
Norwin Co., Freeport, Ill.
Perham Products, Inc., Chicago.
Premier Furnace Co., Dowagiac, Mich.
Roto-Beam Div., Peerless of America. Inc., Chicago.
Scott-Newcomb, Inc., St. Louis.
Standard Computing Scale Co., Air Conditioning & Refrigeration Div., Detroit.

Standard Computing Scale Co., Air Collection Div., Detroit.

Trane Company, La Crosse. Wis.
Unified Air Conditioner Co., Duluth, Minn.
U. S. Air Conditioning Corp., Minneapolis.
X L Refrigerating Co., Inc., Chicago.
York Corp., York. Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS ROOM TYPE SUMMER, FLOOR CABINET. SELF-CONTAINED COMPRES-SOR, UNDER 3 H. P.

(Self-contained blower, coils, compressor and filter unit)

Airtemp Div., Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
Frigidaire Div., General Motors Sales Corp., Dayton, O.
Gale Products, Galesburg, Ill.

General Electric Co., Bloomfield, N. J.
Harvey-Whipple, Inc., Springfield, Mass.
Ice Cooling Appliance Corp., Morrison, Ill. (Ice)

Ilg Electric Ventilating Co., Chicago.
Indian Trailer Corporation, Koolroom Div., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Phileo Radio & Television Corp., Philadelphia.
Pleasantaire Corp., Washington, D. C.

Premier Furnace Co., Dowagiac, Mich.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Scott-Newcomb, Inc., St. Louis.

Viking Manufacturing Corp., Dayton, O.

Viking Manufacturing Corp., Dayton, O. York Corp., York, Pa.

AID CONDITIONING UNITS, ROOM TYPE, WINTER, FLOOR CABINET

(Self-contained blower, filter, heating coil, humidifier unit)

Burnham Boiler Corp., Irvington, N. Y. Campbell Heating Co., Des Molnes, Ia. Carrier Corp., Syracuse, N. Y. Drayer-Hanson, Inc., Los Angeles. General Electric Co., Bloomfield, N. J. Ilg Electric Ventilating Co., Chicago. Kauffman Air Conditioning Corp., St. Louis.

· Advertisement in this issue, See Index to Advertisers, page 314.

Kennard, Inc., Sam, St. Louis. McQuay, Inc., Minneapolis. Perham Products, Inc., Chicago. Refrigeration Economics Co., Inc., Canton, O. Reingeration Economics Co., Inc., Canton, O. Reznor Mfg. Co., Mercer, Pa. Richmond Radiator Co., Inc., Uniontown, Pa. Roto-Beam Div., Peerless of America, Inc., Chicago. Somers, Inc., H. J., Detroit. Standard Computing Scale Co., Air Conditioning and Refrigerations.

tion Div., Detroit. Surface Combustion, Toledo, O.

Surface Combustion, Toledo, O.
Trane Co., La Crosse, Wis.
Unified Air Conditioner Co., Duluth, Minn.
U. S. Air Conditioning Corp., Minneapolis.
Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.
Viking Manufacturing Corp., Dayton, O.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, ROOM TYPE, YEAR AROUND, FLOOR CABINET

(Self-contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply and steam or hot water)

Airtemp Division, Chrysler Corp., Dayton, O. Airtemp Division, Chrysler Corp., Dayton, C Beacon-Morris Corp., Boston, Mass. Betz Engineering Co., Kansas City. Carrier Corp., Syracuse, N. Y. Clarage Fan Co., Kalamazoo, Mich. Curtis Refrigerating Machine Co., St. Louis. General Electric Co., Bloomfield, N. J.

General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

Wis.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Manufacturing Co., Inc., F., Hastings, Nebr.
Kauffman Air Conditioning Corp., St. Louis.
Kelvinator Div., Nash-Kelvinator Corp., Detroit.
Kennard, Inc., Sam, St. Louis.
Kramer Trenton Co., Trenton, N. J.
McQuay, Inc., Minneapolis, Minn.
Marlo Coil Co., St. Louis.
Perham Products, Inc., Chicago.
Pfening Co., Fred D., Columbus, O. (Industrial)
Refrigeration Economics Co., Inc., Canton, O. Refrigeration Economics Co., Inc., Canton, O. Roto-Beam Div., Peerless of America, Inc., Chicago. Roto-Beam Div., Peerless of America, Inc., Chicago, Standard Computing Scale Co., Air Conditioning and Refrigera-tion Div., Detroit. Trane Co., La Crosse, Wis. Unified Air Conditioner Co., Duluth, Minn. York Corp., York, Pa. Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, STORE TYPE, SUMMER, FLOOR CABINET, SELF-CONTAINED COM-PRESSOR, 3 H. P. AND OVER

(Self-contained blower, coil, compressor, filter unit, with air discharge approximately 6 ft. above floor)

Air Conditioning & Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.
Airtemp Div., Chrysler Corp., Dayton, O.
Baker Ice Machine Co., Inc., Omaha, Nebr.
Brunner Manufacturing Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Curtis Refrigerating Machine Co., St. Louis.
Forman Air Conditioning & Eng. Co., New York City (Freon)
Frick Co., Waynesboro, Pa. Forman Air Conditioning & Eng. Co., New York City (Freon)
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton. O.
General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit,

Wis.

Kauffman Air Conditioning Corp., St. Louis.

Kramer Trenton Co., Trenton, N. J.

Nevinger Manufacturing Co., Inc., Greenville, Ill.

Niagara Blower Co., New York City.

Roto-Beam Div., Peerless of America, Inc., Chicago.

Scott-Newcomb, Inc., St. Louis, Mo.

Vilter Mfg. Co., Milwaukee. Westinghouse Electric & Mfg. Co., Springfield, Mass. X L Refrigerating Co., Inc., Chicago. York Corp., York, Pa.

> AIR DIFFUSERS See Diffusers, Air

AIR FILTERS See Filters, Air

AIR METERS See Meters, Air Velocity, Direct Reading

> AIR WASHERS See Washers, Air

ANALYZERS, CO2, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh, Pa. Barclay, Inc., Robert, Chicago.
Defender Automatic Regulator Co., St. Louis.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Engelhard, Inc., Chas., Newark, N. J.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland.
Huyette Co., Inc., Paul B., Philadelphia.
Permutit Co., New York City.
Precision Control Co., San Francisco.
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Service to Industry, West Hartford, Conn.
Uehling Instrument Co., Paterson, N. J.
Weaver Mfg. Co., Springfield, Ill.

ANEMOMETERS

American Instrument Co., Silver Spring, Md. Barclay, Inc., Robert, Chicago. Detroit Air Conditioning Service Co., Inc., Detroit. Friez Instrument Div., Towson, Md.
Hill, E. Vernon, Chicago.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y. Wilson Products, Inc., Reading, Pa. (Thermometer)

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Aluminum Co. of America, Pittsburgh.
American Brass Co., Waterbury, Conn.
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Brasco Manufacturing Co., Harvey, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron structural shapes). shapes).

shapes).

Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Colonial Alloys Co., Philadelphia.

Columbia Steel Co., San Francisco.
Decatur Iron & Steel Co., Decatur, Ala.
Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh.
Laclede Steel Co., St. Louis.
Milcor Steel Co., Milwaukee.
Republic Steel Corp., Cleveland.
Revere Copper & Brass, Inc., New York City.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Truscon Steel Co., Youngstown, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ARC WELDERS See Welders, Arc

ARC WELDING ELECTRODES See Electrodes, Arc Welding

ASBESTOS BOARD See Board, Duct, Asbestos

ASBESTOS PAPER See Paper, Asbestos

ATTIC FANS bee Fans, Night Air Cooling

ATTIC FURNACES

See Furnaces, Warm Air, Air Conditioning for Attic Installation

AUTOMATIC HUMIDIFIERS

See Humidifiers, Furnace, Evaporation, Spray

BAFFLES, OIL BURNER & STOKER

Air Devices, Inc., New York City.
Barclay, Inc., Robert, Chicago.
Harvey, Inc., Sid, Valley Stream, N. Y.
Jones Products Co., Ferndale, Mich.
Laclede-Christy Clay Products Co., St. Louis.
McLeod & Henry Co., Inc., Troy, N. Y.
Monogram Combustion Chamber Co., Philadelphia.
Munn & Steele, Inc., Newark, N. J. (Stoker)
Quigley Co., Inc., New York City.

BALANCING EQUIPMENT FOR FANS

Bear Mfg. Co., Rock Island, Ill.

BALL BEARINGS See Rearings, Ball

BAND SAWS

See Saws, Band, Sheet Metal Cutting

BAR FOLDERS

See Machines, Bar Folders

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes

BASES AND PADS, VIBRATION ISOLATING

Armstrong Cork Co., Lancaster, Pa. (Cork)
Buffalo Forge Co., Buffalo.
Cork Import Corp., New York City (Cork).
Cork Insulation Co., Inc., New York City.
Ehret Magnesia Manufacturing Co., Valley Forge, Pa.
Felters Co., Inc., Boston.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co. Sales Div., Inc., Denver, Colo.
Johns-Manville, New York City.
Keldur Corporation, New York City.
Korfund Co., Inc., Long Island City, N. Y.
Lord Mfg. Co., Erie, Pa.
Manley Products Corp., York, Pa.
Mundet Cork Corp., Brooklyn, N. Y.
National Lead Co., New York City.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York City.
Vibration Eliminator Co., Astoria, N. Y. (Cork and rubber)
Vibration Engineering Co., New York City.
Western Felt Works, Chicago (Felt)

BATHS, TINNING

American Gas Furnace Co., Elizabeth, N. J Eclipse Fuel Engineering Co., Rockford, Ill. Retinning Manufacturing Co., Chicago.

BEADERS

See Machines, Beading

BEAMS

See Angles, Bars, Beams, Channels and Tees (Light weight shapes

BEARINGS, BALL

Ahlberg Bearing Co., Chicago.
Bantam Bearings Div., Torrington Co., South Bend, Ind.
Bearing Co. of America, Lancaster, Pa.
Burgess-Norton Mfg. Co., Geneva, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., New Britain, Conn.
Link-Belt Co., Chicago.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Schatz Mfg. Co., Poughkeepsie, N. Y.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Torrington Co., Torrington, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago, Air Controls, Inc., Cleveland, Caldwell Co., W. E., Louisville, Ky. Central Die Casting & Mfg. Co., Inc., Chicago. Central Die Casting & Mfg. Co., Inc., Chicago.
Chain Belt Co., Milwaukee.
Chicago Die Casting Co., Chicago.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., New Britain, Conn.
Freed Products Co., Moline, Ill.
General Motors Corp., Moraine Products Div., Dayton, O.
Goldens' Fdry. & Machine Co., Columbus, Ga.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jones Foundry & Machine Co., W. A., Chicago.

Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago.
Maple City Stamping Co., Peoria, Ill.
Medart Co., St. Louis.
Norma-Hoffmann Bearing Corp., Stamford, Conn.

Randall Graphite Products Corp., Chicago.
Roversford Foundry & Machine Co., Royersford, Pa.
Shafer Bearing Corp., Chicago.

Roversford Foundry & Machine Co., Royersf Shafer Bearing Corp., Chicago.

SKF Industries, Inc., Philadelphia.

Smith, Inc., Winfield H., Springville, N. Y.

Sprout-Waldron & Co., Muncy, Pa.

Standard Pressed Steel Co., Jenkintown, Pa.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Triangle Manufacturing Co., Oshkosh, Wis.

Viking Air Conditioning Corp., Cleveland.

Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Ahlberg Bearing Co., Chicago. Ahlberg Bearing Co., Chicago.
Bantam Bearings Div., Torrington Co., South Bend, Ind.
Dodge Mfg. Corp., Mishawaka, Ind.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Jones Foundry & Machine Co., W. A., Chicago.
Link-Belt Co., Chicago.
Medart Co., St. Louis.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, Trenton, N. J.
Royersford Foundry & Machine Co., Royersford, Pa.
Shafer Bearing Corp., Chicago.
SKF Industries, Inc., Philadelphia.
Timken Roller Bearing Co., Canton, O.
Torrington Co., Torrington, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, SLEEVE

Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Corp., Detroit.
General Motors Corp., Moraine Products Div., Dayton, O.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Medart Co., St. Louis.
Motex Metal Process Corporation, Detroit.
Randall Graphite Products Co., Chicago.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Wood's Sons Co., T. B., Chambersburg, Pa.

BELTS. V

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Belting Co., Chicago.
Continental Rubber Works, Erle, Pa.
Dayton Rubber Mfg. Co., Dayton, O.
Dick Co., Inc., R. & J., Passalc, N. J.
Lodge Manufacturing Corp., Mishawaka, Ind.
Firestone Tire & Rubber Co., Akron, O.
Gates Rubber Co., Denver, Colo.
Gilmer Co., L. H., Philadelphia, Pa.
Goodrich Co., B. F., Akron, O.
Graton & Knight, Worcester, Mass. (Leather)
Jones Foundry & Machine Co., W. A., Chicago.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.,
Passalc, N. J. Passaic, N. J.

Manheim Mfg. & Belting Co., Manheim, Pa. (Adjustable)

Medart Co., St. Louis.

Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O. Rockwood Manufacturing Co., Indianapolis.
Schieron Co., Chas. A., New York City.
Thermold Rubber Div. of Thermold Co., Trenton, N. J.
United States Rubber Co., New York City.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

BENDERS, ANGLE, ETC.

Champion Blower & Forge Co., Lancaster, Pa. Excelsior Tool & Machine Co., East St. Louis, Iil.

Evans Machine Co., L. R., Sandwich, Iil. Hendley & Whittemore Co., Beloit, Wis.

Hossfield Mfg. Co., Winona, Minn. Martens & Stormoen, Boston 10.

O'Neil-Irwin Mfg. Co., Minneapolis.

Whitney Metal Tool Co., Rockford, Ill.

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BI-METALS, THERMOSTATIC

Chace Co., W. M., Detroit, Mich. General Plate Div., Metals & Controls Corp., Attleboro, Mass. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Wilson Co., The, H. A., Newark, N. J.

BLADES, PROPELLER FAN

Ackermann Manufacturing Co., Wheeling, W. Va.
Aerovent Fan Co., Piqua, O.
Air Controls, Inc., Cleveland.
Aire-Folle Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
Allen Corp., Detroit.
Belanger Fan & Blower Co., Detroit.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irving, N. J.
Circulators & Devices Mfg. Corp., New York City.
Dallas Engineering Co., Inc., Dallas, Tex.
DeBothezat Vent. Eq. Div., American Machine & Metals, Inc.,
East Moline, Ill.
Dual-Air Fan Corp., Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Economy Electric Manufacturing Co., Cicero, Ill.
Electrovent Fan & Mfg. Co., Chicago.
General Aire Co., Philadelphia. Ackermann Manufacturing Co., Wheeling, W. Va.

International Engineering, Inc., Dayton, O.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Lohman, Inc., William J., Irvington, N. J.
Meier Electric & Machine Co., Indianapolis, Ind.
Myers Electric Co., Pittsburgh.
National Engineering & Manufacturing Co., Kansas City.
Norwin Co., Freeport, Ill.
Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Roto-Beam Div., Peerless of America, Chicago.
Schwitzer-Cummins Co., Indianapolis.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Hyde Park, Boston.
Swift Mfg. Co., Detroit.
Torrington Mfg. Co., Torrington, Conn.
Utility Fan Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.

BLAST GATES

Allington & Curtis Mfg. Co., Saginaw, Mich.

Allington & Curtis Mfg. Co., Saginaw, Mich.

Berger Bros. Co., Philadelphia.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.

Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis.
Goethel Sheet Metal Works, Alfred, Milwaukee.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids. Mich.
Kirk & Blum Mfg. Co., Cincinnati.
Maysteel Products, Inc., Mayville, Wis.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
R-S Products Corp., Philadelphia.
Spencer Turbine Co., Hartford, Conn.
Sturtevant Co., B. F., Hyde Park, Boston.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee.

BLINDS, VENETIAN

Athey Co., Chicago.

Bostwick-Goodell Co., Norwalk, O.
Chicago Venetian Blind Co., Chicago.
Columbia Mills, Inc., Saginaw, Mich.
Hough Shade Corporation, Janesville, Wis.
Kane Mfg. Corporation, Kane, Pa.
Miller-Connell Mfg. Co., Inc., Chicago.
Patterson Products Co., Indianapolis (Wood).
Russell Co., F. C., Cleveland.
Standard Products Co., Detroit.
Warren Shade Co., Inc., Minneapolis.
Yardley Venetian Blind Co., Columbus, O.

BLOWER—FILTER UNITS

(Separate Conversion Units for Warm Air Furnaces)

(Separate Conversion Units for Warm Air Furnaces)

Agricola Furnace Co., Inc., Gadsden, Ala.

Air Conditioning Equipment Co., Minneapolis.

Air Controls, Inc., Cleveland.

Air Washer Corporation, Lansing, Mich.

American Foundry & Furnace Co., Bloomington, Ill.

American Furnace & Foundry Co., Milan, Mich.

American Furnace & Foundry Co., Milan, Mich.

American Machine Products Co., Marshalltown, Ia.

American Radiator & Standard Sanitary Corp., Pittsburgh.

Ames Co., W. R., San Francisco.

Arcweld Manufacturing Co., Inc., Seattle, Wash.

Armstrong Furnace Co., Columbus, O.

Atlas Heating & Ventilating Co., Ltd., San Francisco.

Auburn Burner Co., Auburn, Ind.

Bard Mfg. Co., Bryan, O.

Barrett Engineers, Cleveland Heights, O.

Bishop & Babcock Mfg. Co., Cleveland.

Bovee Furnace Works, Waterloo, Ia.

Brundage Co., Kalamazoo, Mich.

Bryant Corp., C. L., Cleveland.

Campbell Heating Co., Des Moines, Ia.

Char-Gale Mfg. Co., Minneapolis.

Cleveland Steel Products Corp., Torridheet Div., Cleveland.

Conco Corporation, Mendota, Ill.

Des Moines Stove Repair Co., Des Moines, Ia.

Dowagiac Steel Furnace Co., Dowagiac, Mich.

Economy Electric Mfg. Co., Cleero, Ill.

Front Rank Furnace Co., Clero, Ill.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

Furblo Co., Hermansville, Mich.

Gehri Co., Tacoma, Wash.

General Blower Corp., San Francisco.

Gilbert & Barker Mfg. Co., West Springfield, Mass.

Green Colonial Furnace Co., Des Moines, Ia.

Hall-Neal Furnace Co., Indianapolis.

Harvey-Whipple, Inc., Springfield, Mass.

Hastings Air Conditioning Co., Inc., Hastings, Nebr.

Hess Warming & Ventilating Co., Chicago.

Homer Furnace & Foundry Corp., Coldwater, Mich.

Jaden Mfg. Co., Inc., F., Hastings, Nebr.

Hessey Heating Co., Syracuse, N. Y.

Lau Blower Co., Dayton, O.

Lennox Furnace Co., Marshalltown, Ia.

MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill. Agricola Furnace Co., Inc., Gadsden, Ala

Advertisement in this issue. See Index to Advertisers, page 314.

- · Majestic Co., Huntington, Ind.
- Majestic Co., Huntington, Ind.
 Maple City Stamping Co., Peoria, Ill.
 Marshall Furnace Co., Marshall, Mich.
 Meyer Furnace Co., Peoria, Ill.
 Montag Stove & Furnace Works, Portland, Ore.
 Mueller Furnace Co., L. J., Milwaukee.
 National Manufacturing & Engineering Co., Detroit. Mueller Furnace Co., L. J., Milwaukee.
 National Manufacturing & Engineering Co., Detroit.
 New-Aire Blower Co., Dearborn, Mich.
 Northwest Stove & Furnace Works, Inc., Portland, Ore.
 Olsen Mfg. Co., C. A., Elyria, O.
 Palmer Manufacturing Corp., Phoenix, Ariz.
 Patten Co., J. V., Sycamore, Ill.
 Payne Furnace & Supply Co., Beverly Hills, Calif.
 Peerless Electric Co., Warren, O.
 Peerless Foundry Co., Indianapolis.
 Pennsylvania Furnace & Iron Co., Warren, Pa.
 Premier Furnace Co., Dowagiac, Mich.
 Royal Air Conditioning Equip. Co., Alhambra, Calif.
 Rudy Furnace Co., Dowagiac, Mich.
 Rybolt Heater Co., Ashland, O.
 Ryniker Steel Products Co., Billings, Mont.
 St. Louis Furnace Mfg. Co., St. Louis.
 Sandberg Co., H. J., Portland, Ore.
 Schwab Furnace Co., Milwaukee.
 Schwitzer-Cummins Co., Indianapolis.
 Security Manufacturing Co., Kansas City.
 Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
 Spray Wheel Air Conditioners, Inc., Denver, Colo.
 U. S. Air Conditioning Corp., Minneapolis.
 Utility Fan Corporation, Los Angeles.
 Viking Air Conditioning Corp., Cleveland.
 Waterman-Waterbury Co., Minneapolis.
 Wayne Automatic Relay Co., Fort Wayne, Ind.
 Western Blower Co., Seattle, Wash.
 Williamson Heater Co., Cincinnati.

BLOWER HOUSINGS

See Housings, Blowe

BLOWER-WASHER UNITS, FOR CLEANING OR HUMIDIFYING

(Separate Conversion Units for Warm Air Furnaces)

Air Stream Filter Corp., St. Louis. Airwasher Corporation, Lansing, Mich.

Airwasher Corporation, Lansing, Mich.
American Blower Corporation, Detroit.
American Machine Products Co., Marshalltown, Ia.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Bishop & Babcock Mfg. Co., Cleveland.
Brauer Supply Co., A. G., St. Louis.
Brundage Co., Kalamazoo, Mich.
Hess Warming & Ventilating Co., Chicago.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
National Engineering & Manufacturing Co., Kansas City.
New York Blower Co., Chicago.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Spray Wheel Air Conditioners, Inc., Denver, Colo.

BLOWER WHEELS See Wheels, Blowe

BLOWERS, FORCED DRAFT, FOR ASH PIT

American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ili.
Barrett Engineers, Cleveland Heights, O.
Buffalo Forge Co., Buffalo.
Burnwell Corp., Allentown, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Economy Electric Mfg. Co., Clcero, Ill.
Fuel Savers, Inc., Harrisburg, Pa.
Garden City Fan Co., Chicago.
General Blower Co., Chicago.
General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.

General Blower Co., Inc., Philadelphia.
International Engineering, Inc., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
Martin Fan & Blower Co., Chicago.
Mohler Co., J. K., Ephrata, Pa.
New York Blower Co., Chicago.
Smith Manufacturing Co., Inc., F. A., Rochester, N. Y.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Hyde Park, Boston.
Universal Blower Co., Birmingham, Mich.
Wing Mfg. Co., L. J., New York City.

BLOWERS, FORCED DRAFT, FOR SMOKE PIPE

American Foundry & Furnace Co., Bloomington, Ill. Barrett Engineers, Cleveland Heights, O. Garden City Fan Co., Chicago. General Blower Co., Chicago. Martin Fan & Blower Co., Chicago. Muncie Gear Works, Muncie, Ind. New York Blower Co., Chicago.

BLOWERS, FURNACE CENTRIFUGAL

BLOWERS, FURNACE CENTRIFUGAL

Agricola Furnace Co., Inc., Gadsden, Ala.

Air Conditioning Equipment Co., Minneapolis.

Air Controls, Inc., Cleveland.

Aladdin Heating Corporation, Oakland, Calif.

American Blower Corp., Detroit.

American Foundry & Furnace Co., Bloomington, Ill.

American Foundry & Furnace Co., Bloomington, Ill.

American Furnace Co., St. Louis, Mo.

American Machine Products Co., Marshalitown, Ia.

Ames Co., W. R., San Francisco.

Atlas Heating & Ventilating Co., Ltd., San Francisco.

Auburn Burner Co., Auburn, Ind.

Barrett Engineers, Cleveland Heights, O.

Bishop & Babcock Mfg. Co., Cleveland.

Brundage Co., Kalamazoo, Mich.

Buffalo Forge Co., Buffalo.

Campbell Heating Co., Des Moines, Ia.

Chandler Co., Cedar Rapids, Ia.

Clarage Fan Co., Kalamazoo, Mich.

Economy Electric Mfg. Co., Cicero, Ill.

Electrogas Furnace Co., San Francisco.

Essick Manufacturing Co., Los Angeles.

Freed Products Co., Moline, Ill.

Furblo Co., Hermansville, Mich.

Gehri Co., Tacoma, Wash.

General Blower Co., Chicago.

General Blower Corp., San Francisco.

Grand Rapids Die & Tool Co., Grand Rapids, Mich.

Hastings Air Conditioning Co., Inc., Hastings, Nebr.

Hess Warming & Ventilating Co., Chicago.

Jaden Mfg. Co., Inc., F., Hastings, Nebr.

Lau Blower Co., Dayton, O.

Lennox Furnace Co., Marshalltown, Iowa.

Majestic Co., Huntington, Ind.

Maple City Stamping Co., Peoria, Ill.

Monton Stove & Eurnace Works, Portland, Ore.

Maple City Stamping Co., Peoria, Ill.
Martin Fan & Blower Co., Chicago.
Mauer Engineering, Evanston, Ill.
Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.

Morrison Products, Inc., Cleveland.
Mountain States Equipment Company, Denver, Colo.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Engineering Co., Detroit.
New-Aire Blower Co., Dearborn, Mich.
New York Blower Co., Chicago.
Northern Furnace & Supply Company, Billings, Mont.

Palmer Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Peerless Electric Co., Warren, O.
Premier Furnace Co., Dowagiac, Mich.
Reynolds Mfg. Co., Grand Rapids, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
Rudy Furnace Co., Dowagiac, Mich.
Ryniker Steel Products Company, Billings, Mont.
Security Manufacturing Co., Kansas City, Mo.
Schwitzer-Cummins Co., Indianapolis.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe
& Heater Co., Inc., St. Louis.
Skuttle Manufacturing Co., Detroit.
Southern Fan & Blower Co., Dallas, Tex.
Spray Wheel Air Conditioners, Inc., Denver, Colo.
Sturtevant Co., B. F., Hyde Park, Boston.
U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Viking Air Conditioning Corp., Cleveland.
Waterman-Waterbury Co., Minneapolis.
Western Blower Co., Seattle, Wash.

Waterman-Waterbury Co., Minneapolis Western Blower Co., Seattle, Wash.

BLOWERS, VENTILATING SYSTEM (Capacity 4,000 c.f.m. up)

Advance Fan & Blower Co., Detroit. Air Controls, Inc., Cleveland. Air-O-Line Co., Dallas, Tex.

Air Controls, Inc., Cleveland.
Air-O-Line Co., Dallas, Tex.
Aladdin Heating Corporation, Oakland, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blower Corp., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Company, Marshalltown, Ia.
Ames Co., W. R., San Francisco.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Ballantyne Co., Omaha, Nebr.
Bayley Blower Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
Brundage Co., Kalamazoo, Mich.
Buffalo Forge Co., Buffalo.
Campbell Heating Co., E. K., Kansas City, Mo.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Coppus Engineering Corp., Worcester, Mass.
De Bothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.
Economy Electric Manufacturing Co., Cicero, Ill.
Electrovent Fan & Mfg. Co., Chicago.
Furblo Co., Hermansville, Mich.
Garden City Fan Co., Chicago. Garden City Fan Co., Chicago.

General Blower Co., Chicago.
General Blower Co., Inc., Philadelphia.

• Advertisement in this issue. See Index to Advertisers, page 314.

Grand Rapids Die & Tool Co., Grand Rapids, Mich. Hastings Air Conditioning Company, Inc., Hastings, Nebr.
Ilg Electric Ventilating Co., Chicago.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Johnson Fan & Blower Corp., Chicago.
King Ventilating Co., Owatonna, Minn.
La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio.
Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Mountain States Equipment Co., Denver, Colo.
National Engineering & Manufacturing Co., Kansas City.
National Manufacturing & Engineering Co., Detroit.
Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Niagara Blower Co., Cleveland.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Reynolds Manufacturing Co., Grand Rapids, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
Schwitzer-Cummins Co., Indianapolis.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., St. Louis.
Southern Fan & Blower Co., Dallas, Tex.
Spray Wheel Air Conditioners, Inc., Denver, Colo.
Sturtevant Co., B. F., Hyde Park, Boston.
Supreme Heater & Ventilating Corp., St. Louis.
Torit Manufacturing Co., St. Paul, Minn.
Trane Company, LaCrosse, Wis.
U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.
Wing Mfg. Co., L. J., New York City.

BLOW PIPE EQUIPMENT

See Blast Gates; Collectors, Blow Pipe; Fittings, Blow Pipe

BOARD, SUBSTITUTE MATERIAL, FOR DUCTS

Johns-Manville, New York City.
Keasbey & Mattison Company, Ambler, Pa.
Keystone Asphalt Products Co., Chicago.
Masonite Corporation, Chicago.
Ruberoid Co., New York City.
Sall Mountain Co., Chicago.
United States Gypsum Company, Chicago.
Wilson Inc. Grant Chicago.

Wilson, Inc., Grant. Chicago.

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BOLTS, EXPANSION

Chase Brass & Copper Co. Incorporated, Waterbury. Conn. Chase Brass & Copper Co. Incorporated, Waterbury, Chicago Expansion Bolt Co., Chicago, Diamond Expansion Bolt Co., Inc., Garwood, N. J. Fee & Mason Mfg. Co., Inc., New York City.
National Lead Co., New York City.
Ohio Brass Co., Mansfield, Ohio.
Paine Company, The, Chicago.
Rawlplug Company, Inc., New York City.
Rolyan Corp., Chicago.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOLTS, TOGGLE AND ANCHOR

Carty & Moore Engineering Co., Detroit (Anchor). Chase Brass & Copper Co., Incorporated, Waterbury, Conn. Chicago Expansion Bolt Co., Chicago. Chicago Expansion Bolt Co., Chicago.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., New York City.
Grabler Mfg. Co., Cleveland.
Paine Company, The. Chicago.
Rawlplug Company, Inc., New York City.
Rolyan Corp., Chicago.
Star Expansion Bolt Co., New York City.
U. S. Expansion Bolt Co., Inc., York, Pa.

BOOSTER FANS See Fans, Booster

BOOTS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

BRAKES, METAL WORKERS', HAND

BRAKES, MEIAL WORKERS', HAND
Bertsch & Co., Cambridge City, Ind.
Clearing Machine Corp., Chicago.

Dreis & Krump Mfg. Co., Chicago.
Eiker Mfg. Co., Ogallala, Nebr.
Excelsior Tool and Machine Co., East St. Louis, Ill.
New Albany Machine Mfg. Co., New Albany, Ind.

Niagara Machine & Tool Works, Buffalo.
O'Neill-Irwin Mfg. Co., Minneapolis.
O'Neill-Irwin Mfg. Co., Southington, Conn.
Weiss & Co., H., New York City.

Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', PORTABLE

Dreis & Krump Mfg. Co., Chicago. Eiker Mfg. Co., Ogallala, Nebr. Harris, A. R., Hammond, Ind. O'Neil-Irwin Mfg. Co., Minneapolis. St. Louis Tool Co., St. Louis.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', POWER

i k

Bath Company, Cyril, Cleveland. Bath Company, Cyril, Cleveland.
Bertsch & Co., Cambridge City, Ind.
Clearing Machine Works. Chicago.
Cincinnati Shaper Co., Cincinnati.

Dreis & Krump Mfg. Co., Chicago.
Heartley Machine & Tool Co., Toledo, O.
Ohl & Co., Geo. A., Newark, N. J.

Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
Swaine Mfg. Co., Fred J., St. Louis.

Verson Allsteel Press Co., Chicago.
Weiss & Co., H., New York City.

Whitney Metal Tool Co., Rockford, Ill.

BRUSHES, ACID

Lukens Metal Co., Thos. F., Philadelphia.

• Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
Potomac Mfg. Co., Philadelphia.

• Schaefer Brush Mfg. Co., Milwaukee (Rustproof).
Weiss & Co., H., New York City.

BRUSHES, FURNACE

Mill-Rose Co., Cleveland.
Milwaukee Brush Mfg. Co., Milwaukee.
Osborn Mfg. Co., Cleveland.
Pilley Brush Co., Fort Madison, Iowa.
Schaefer Brush Mfg. Co., Milwaukee.
Worcester Brush & Scraper Co., Worcester, Mass.

BUFFERS, GRINDERS, POLISHERS AND SANDERS,

BUFFERS, GRINDERS, POLISHERS AND SANDERS, ELECTRIC

Albertson & Co., Inc., Sioux City, Iowa.
Baldor Electric Co., St. Louis.

Black & Decker Mfg. Co., Towson, Md.
Brown-Brockmeyer Co., Inc., Dayton, O.
Buckeye Portable Tool Co., Dayton, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Pneumatic Tool Co., New York City.
Cincinnati Electric Tool Co., Cincinnati (with dust collector).
Clark Jr. Electric Co., Jas., Louisville, Ky.
Continental Machines Incorporated, Minneapolis.
Detroit Surfacing Machine Co., Detroit.
Diehl Mfg. Co., Somerville, N. J.
Hammond Machinery Builders, Kalamazoo, Mich.
Haskins Co., R. G., Chicago.
Hobart Brothers Company, Troy, O.

Independent Pneumatic Tool Co., Chicago.
Jefferson Machine Tool Co., Cincinnati.
Keller, Inc., Wm. H., Grand Haven, Mich. (Pneumatic).
Lee Co., K. O., Aberdeen, S. D.
Mall Tool Co., Chicago.
Millers Falls Co., Greenfield, Mass.
Misener Mfg. Co., Inc., Syracuse, N. Y.
Reynolds Electric Company, Chicago.
Skilsaw, Inc., Chicago.
Snap-On Tools Corp., Kenosha, Wis.

Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
Stow Mfg. Co., Binghampton, N. Y.

Stanley Electric Tool Div., The Stanley Wolfer.
Conn.
Stow Mfg. Co., Binghampton, N. Y.
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
U. S. Electrical Motors, Inc., Los Angeles.
Van Dorn Electric Tool Co., Towson, Md.
Wodack Electric Tool Corp., Chicago.
York Electric and Machine Company, York, Pa.

BURNERS, GAS, CONVERSION, RESIDENTIAL
Auburn Burner Co., Auburn, Ind.
Autogas Company, Chicago.
Barber Gas Burner Co., Cleveland.
Bard Manufacturing Company, Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Bryan Steam Corp., Peru, Ind.
Bryant Corp., C. L., Cleveland.
Bryant Heater Co., Cleveland.
Burdett Mfg. Co., Chicago.
Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Columbia Burner Co., Toledo. Cleveland Steel Products Corp., Torridheet Div., of Columbia Burner Co., Toledo.
Continental Stove Corp., Ironton, O. Dalzen Manufacturing Co., Detroit.
Eclipse Fuel Engineering Co., Rockford, Ill.
Franklin Gas Heating Co., Cincinnati.
Handley-Brown Heater Co., Jackson, Mich.
Jackson Sheet Metal Works, Ogden, Utah.
Johnson Gas Appliance Co., Cedar Rapids, Iowa.
Kais Sunrise Works, Detroit.

· Advertisement in this issue. See Index to Advertisers, page 314.

AMERICAN ARTISAN, January, 1944

Leahy Mfg. Co., Los Angeles. Martin, J. O. & C. U., San Francisco. Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex. National Machine Works, Chicago. National Machine Works, Chicago,
Ray Oil Burner Company, San Francisco.
Roberts-Gordon Appliance Corp., Buffalo.
Rotary Mfg. Co., Los Angeles.
Security Manufacturing Co., Kansas City, Mo.
Sonner Burner Co., Winfield, Kans.
Standard-Heating & Radiator Co., Pittsburgh.

Surface Combustion, Toledo, O.
Webster Engineering Co., Tulsa, Okla.

Zinc Co., John, Tulsa, Okla.

BURNERS, OIL, CONVERSION, RESIDENTIAL

Acme Oil Burner Company, Inc., Cedar Rapids, Ia. (Gun). Airtemp Division, Chrysler Corp., Dayton, Ohio. Aldrich Co., Wyoming, Ill. American Radiator & Standard Sanitary Corp., Pittsburgh. (Gun) Anchor Post Fence Co., Heating Div., Baltimore (Gun & Rotary) Arcweld Mfg. Co., Inc., Seattle, Wash. Auburn Burner Co., Auburn, Ind. (Gun and rotary). Auto-Heat Corp., New York City (Gun). Automatic Burner Corp., Chicago (Gun and rotary). Badger Mfg. Co., Madison, Wis. (Gun). Badger Mfg. Co., Madison, Wis. (Gun).
Bard Manufacturing Company, Bryan, Ohio.
Beckett Engineering Co., R. W., Elyria, Ohio (Gun).
Bethlehem Foundry & Machine Co., Bethlehem, Pa. (Gun).
Bovee Furnace Works, Waterloo, Ia. (Gun).
Brigham Oil Burner Co., St. Louis (Gravity).
Bryan Steam Corp., Peru, Ind. (Rotary and gun).
Caloroll Burner Corp., Hartford, Conn. (Atmospheric, gun, horizontal rotary, vacuum pressure, wall flame). zontal rotary, vacuum pressure, wall flame).
Campbell Machine Co., Minneapolis.
Cary Mfg. Co., Waupaca, Wis. (Gravity).
Century Engineering Corp., Cedar Rapids, Ia. (Gun).
Chalmers Oil Burner Co., Minneapolis (Gun and rotary).
Chandler Company, Cedar Rapids, Iowa (Gun and gravity).
Chicago Steel Furnace Co., Chicago.
Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Columbus Metal Products, Inc., Columbus, Ohio (Gravity).
Crane Company, Chicago (Gun).
Delco Appliance Div., General Motors Corp., Rochester, N. Y.

Crane Company, Chicago (Can).

Delo Appliance Div., General Motors Corp., Rochester, N. Y. (Gun).

D'Elia Oil Burner Co., Inc., Bridgeport, Conn. (Gun).

Dowagiac Steel Furnace Company, Dowagiac, Mich.
Eastern Oil Equipment Co., Portland, Me. (Gun).
Electrol Mfg. Co., Passaic, N. J. (Gun).
Excello Oil Heating Corp., Omaha, Nebr.
Fairfield Oil Heating Co., Inc., Greenwich, Conn. (Gun).
Fargo Foundry Co., Fargo, N. D. (Gun).
Florence Stove Co., Gardner, Mass. (Gravity).

General Oil Heating Corp., West New York, N. J. (Gun).
General Oil Heating Corp., West Springfield, Mass. (Gun).
Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y. (Gun).
Gould Engineering Co., Cambridge, Mass. (Gun).
Green Colonial Furnace Co., Indianapolis.
Hardinge Oil Burner & Mfg. Co., Chicago (Gun and rotary).
Hart Oil Burner Div., Avery Farm Machinery Co., Peorla, Ill.
(Gun).

Hart Oil Burner Div., Avery Farm Machinery Co., Peorla, Ill. (Gun).

Harvey-Whipple, Inc., Springfield, Mass. (Gun).

Heatseal Burner Co., Omaha, Nebr. (Gun).

Heil Co., Milwaukee (Gun).

Herco Oil Burner Corp., Lancaster, Pa.

Hess Warming and Ventilating Co., Chicago.

Hipoint Corp., Bellefontaine, O.

Holtum Mfg. Co., Freeport, Ill. (Gun).

Homer Furnace & Foundry Corp., Coldwater, Mich. (Gun).

Hotentot Co., Inc., Omaha, Nebr. (Gun).

Hubbard Co., Minneapolis (Gun).

Hueller Mfg. Co., Inc., H. J., Brooklyn (Gun).

Iowa Foundry Co., Sioux City, Ia.

Jackson Oil Burner Co., Detroit (Vertical Gun).

Johnson Mfg. Co., Waterloo, Ia. (Gun).

Kais Sunrise Works, Detroit (Gravity, Rotary, Gun).

Kaybar Burner Corp., Chicago.

Keith Furnace Co., Des Moines, Ia. (Gun).

Kleen Heet, Inc., Chicago (Gun, Gravity, Rotary).

Korth Oil Burner Corp., Roselle Park, N. J. (Rotary and gun).

Laco Oil Burner Co., Griswold, Ia. (Gun and Gravity).

Leahy Mfg. Co., Los Angeles.

Leeson Air Conditioning Corporation, Detroit (Gun).

Lennox Furnace Co., Marshalltown, Iowa (Gun—Pressure Atomizing).

Little Burner Co., Inc., H. C., San Rafael, Calif. (Gravity).

Lennox Furnace Co., Marshalltown, 10wa (Gun—Pressure Atomizing).
Little Burner Co., Inc., H. C., San Rafael, Calif. (Gravity).
Littleford Bros., Inc., Cincinnati.

Majestic Co., Huntington, Ind. (Gun).
Malleable Iron Fittings Co., Branford, Conn. (Gun).
May Oil Burner Corp., Baltimore (Gun).
Mayflower Oil Burner Corp., West New York, N. J. (Gun).
McIlvaine Products, Inc., Philadelphia (continuous variable flame)

Meyer Furnace Co., Peoria, Ill. (Gun).
 Miller Co., Meridian, Conn.

Montag Stove & Furnace Works, Portland, Ore. (Gun).

• Mueller Furnace Co., L. J., Milwaukee (Gun, Gravity).

National Airoil Burner Co., Philadelphia (Gun).

National Iron Works, San Diego, Calif. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit. Nu-Way Corp., Rock Island, Ill. (Gun).
Oil Devices, Chicago (Pot Type). Hi Iw Ju

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AMB

Nu-Way Corp., Rock Island, Ill. (Gun).
Oil Devices, Chicago (Pot Type).
Pan-American Engineering Company, Berkeley, Calif. (Gun, rotary and turbine).
Paragon Oil Burner Corp., Brooklyn.
Peerless Oil Burner Co., Inc., Kansas City, Mo. (Gravity).
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (Gun).
Petroleum Heat & Power Co., Stamford, Conn. (Gun).
Preferred Utilities Manufacturing Corp., New York City.
Quaker Mfg. Co., Chicago (Vaporizing Bowl).
Quick Furnace & Supply Co., Des Moines, Ia.
Quiet-Heet Mfg. Corp., Newark, N. J. (Gun).
Quincy Stove Mfg. Co., Quincy, Ill. (Gravity).
R-S Products Corp., Philadelphia (Gun).
Ray Oil Burner Co., San Francisco (Gun, gravity and rotary).
Reif-Rexoil, Inc., Buffalo.
Rotary Mfg. Co., Los Angeles (Rotary).
Round Oak Co., Dowagiac, Mich. (Gun).
Rudy Furnace Co., Dowagiac, Mich. (Gun).
Sanmyer Corporation, Chicago (Gun).
Sandberg Co., H. J., Portland, Ore.
Scott-Newcomb, Inc., St. Louis (Gun).
Shedlov Oil Burners, Inc., Minneapolis (Gravity, gun).
Silent Glow Oil Burner Corp., Hartford, Conn. (Gun and rotary).
Silent Sloux Oil Burner Corp., Orange City, Ia. (Gravity).
Simplex Oil Heating Corp., West Orange, N. J. (Gun, Rotary, Turbine).
Sundstrand Engineering Co., Rockford, Ill. (Gun).

Sundstrand Engineering Co., Rockford, Ill. (Gun).
Syncro-Flame Burner Corp., Willimantic, Conn. (Gun, rotary).
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit

Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit (Gun and rotary).

Todd Combustion Equipment, Inc., New York City.
United States Burner Corp., Wethersfield, Conn. (Gun).
Universal Manufacturers, Inc., Midland Park, N. J.
Valley Mfg. Co., Athol, Mass. (Gun and rotary).
Victor Oil Burner Mfg. Co., Hartford, Conn. (Gravity).
Volcano Burner Corp., New York City (Gun).
Vortex Mfg. Co., Portland, Ore.

Waterman-Waterbury Co., Minneapolis (Gun).

Wayne Oil Burner Co., Fort Wayne, Ind. (Gun and gravity).
Weatherall Engineers, Inc., Providence, R. I. (Gun).
Westwick & Son, Inc., John, Galena, Ill. (Gun).

Williams Oil-O-Matic Heating Corp., Bloomington, Ill. (Gun).
Wood Industries, Inc., Gar, Detroit (Gun).
York Electric and Machine Company, York, Pa.

York-Heat Div., York-Shipley, Inc., York, Pa. (Gun).
York Corp., York Pa. (Gun).

BURRING MACHINES See Machines, Burring

CABINETS AND CASINGS

Acme Tin Plate & Roofing Supply Co., Philadelphia, Airwasher Corporation, Lansing, Mich. Armstrong Furnace Company, Columbus, Ohio. Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O. Biersach & Niedermeyer Company, Milwaukee. Brundage Co., Kalamazoo, Mich. Char-Gale Mfg. Co. Minneapolis

Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Falstrom Co., Passaic, N. J.
General Blower Corp., San Francisco.
General Metal Products Co., St. Louis.
HAUSS

General Metal Products Co., St. Louis.
Hauserman Co., E. F., Cleveland.

Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
Lindsay and Lindsay, Chicago,
Maysteel Products, Inc., Mayville, Wis.
Mitchell Air Conditioning Co., Inc., Schenectady, N. Y.
Mullins Mfg. Corp., Warren, Ohio.
National Manufacturing & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Inc. Portland, Oce. National Manufacturing & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Inc., Portland, Ore.
Reliable Sheet Metal Engineering Co., Chicago (Metal).
Riester & Thesmacher Co., Cleveland.
St. Charles Mfg. Co., St. Charles, Ill.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow
Pipe & Heater Co., Inc., St. Louis.
Standard Pressed Steel Co., Jenkintown, Pa.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Waterman-Waterbury Company, Minneapolis.

CAPS AND TOPS, CHIMNEY

Accurate Mfg. Works, Chicago.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Adams Company, The, Dubuque, Iowa.
Allen Corp., Detroit.
Ames Co., W. R., San Francisco.
Chicago Metal Mfg. Co, Chicago.
Edwards Mfg. Co., Inc., Cincinnati.
Excelsior Steel Furnace Co., Chicago.

Hirschman Co., Inc., W. F., Buffalo. Iwan Brothers, South Bend, Ind. Juniper Elbow Company, Inc., Middle Village, L. I., N. Y. (Shanty and Revolving Caps). (Shanty and Revolving Caps).

Lamb & Ritchie Co., Cambridge, Mass.

Little Burner Co., Inc., H. C., San Rafael, Calif.

Meyer & Bro. Co., F., Peoria, Ill.

Milcor Steel Co., Milwaukee, Wis.

Neemes Foundry, Inc., Troy, N. Y.

Northern Furnace & Supply Company, Billings, Mont.

Osborn Co., J. M. & L. A., Cleveland.

Peters-Dalton, Inc., Detroit.

Royal-Apex Mfg. Corp., Brooklyn.

Ryniker Steel Products Company, Billings, Mont.

Schoedinger, F. O., Columbus, O.

Sheet Metal Mfg. Co., Inc., Brooklyn.

Southbridge Roofing Co., Inc., Southbridge, Mass.

Sterling Foundry Company, Sterling, Ill. (Cast iron).

Tierney Rotor Ventilator Co., Minneapolis.

Vall Mfg. Co., Fort Wayne, Ind.

CASINGS

See Cabinets and Casings

CAULKING COMPOUNDS

See Compounds, Caulking

CEILINGS, METAL

CEILINGS, METAL

Brooklyn Metal Ceiling Co., Brooklyn.
Canton Steel Ceiling Co., New York City.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Edwards Mfg. Co., Inc., Cincinnati.
Friedley-Voshardt Co., Chicago.
International Steel Company, Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
Martin-Parry Corp., York, Pa.
Mesker & Co., Geo. L., Evansville, Ind.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Simplex Ceiling Co., New York City (Perforated Panels).
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wheeling Corrugating Co., Wheeling, W. Va.
Woolwine Metal Products Co., Los Angeles.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago. Armstrong Co., Detroit. Botfield Refractories Co., Philadelphia. Acme Asbestos Covering & Flooring Co., Chicago.
Armstrong Co., Detroit.
Botfield Refractories Co., Philadelphia.
Buckeye Products Co., Cincinnati.

Carey Co., Philip, Lockland, Ohio.
Chicago Fire Brick Company, Chicago.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos).
Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fireline Stove & Furnace Lining Co., Chicago. (Asbestos).
Glidden Company, Cleveland.
Green Fire Brick Co., A. P., Mexico, Mo.
Hercules Chemical Co., Inc., New York City.
Hetzel Roofing Products Co., Newark, N. J.
Johns-Manville, New York City.
Keasbey Co., Robert A., New York City (Asbestos).
Klee Co., George B., Cincinnati.
Krehbiel Co., J. H., Chicago.
Laclede-Christy Clay Products Co., St. Louis.
Lastik Products Co., Inc., Pittsburgh.
McLeod & Henry Co., Inc., Troy, N. Y.
Munn and Steele, Inc., Newark, N. J.
Nebel Manufacturing Co., Cleveland.
Pecora Paint Co., Philadelphia (Asbestos).
Plastic Products Co., Detroit.
Preferred Utilities Mfg. Corp., New York City.
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City.
Robinson Insulation Corp., New York City.
Robinson Insulation Corp., New York City.
Robinson Insulation Co., Great Falls, Mont.
Ruberlod Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Sall Mountain Co., Chicago.
Sauereisen Cements Co., Sharpsburg, Pa.
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit.
Tamms Silica Company, Chicago.
U. S. Stoneware Company, Chicago.
Standard Fuel Engineering Co., Detroit.
Tamms Silica Company, Chicago.
U. S. Stoneware Company, Chicago.
Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago.
Baldwin-Hill Co., Trenton, N. J. (Rockwool),
Barrett Division, Allied Chemical & Die Corporation, New York

City.
Bird Archer Co., Philadelphia.
Botsfield Refractories Co., Philadelphia.
Carey Co., Philip, Lockland, Ohio (Asbestos, Mag., Rockwool).
Carney Rockwell Co., Mankato, Minn. (Rockwool).

Chicago Fire Brick Co., Chicago (Asbestos).
Clinton Metallic Paint Co., Clinton, N. Y.
Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Eagle-Picher Lead Co., Cincinnati (Asbestos).
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Asbestos).
Green Fire Brick Company, A. P., Mexico, Mo. (Vermiculite).
Industrial Research, Lansdowne, Pa.
International Vermiculite Co., Springfield, Ill. (Vermiculite).
Johns-Manville, New York City (Asbestos).
Keasbey Co., Robert A., New York City (Asbestos).
Keasbey & Mattison Co., Ambler, Pa. (Asbestos).
Kreablel Co., J. H., Chicago (Asbestos, mineral wool).
McLeod & Henry Co., Inc., Troy, N. Y.
Mitchell & Smith, Inc., Mineral Felt Div., Detroit (Rock Wool).
Munn and Steele, Inc., Newark, N. J. (Vermiculite).
National Gypsum Co., Buffalo.
Nelson Mfg. Co., B. F., Minneapolis (Vermiculite, Asbestos).
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ohmlac Paint & Refining Co., Chicago (Asphalt, Asbestos).
Owens-Corning Fiberglas Corp., Toledo, Ohio (Mineral Wool).
Plant Rubber & Asbestos Works, Inc., San Francisco (Asbestos).
Pibrico Jointless Firebrick Co., Chicago.
Poe Co., C. W., Cleveland (Mineral Wool).
Preferred Utilities Mfg. Corp., New York City.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City (Asbestos).
Ramitle Co., Div. of S. Obermayer Co., Chicago.
Refractory & Insulation Corp., New York City (Wool).
Rex Clay Products Co., Detroit.
Robinson Insulation Co., Great Falls, Mont. (Vermiculite).
Rock Fleece Co., El Paso, Texas.
Ruberold Co., New York City (Asbestos).
Sall Mountain Co., Chicago.
Sauerelsen Cements Co., Pittsburgh.

Sall Mountain Co., Chicago.
Sauereisen Cements Co., Pittsburgh.
Schundler & Co., Inc., F. E., Joliet, Ill.
Smith & Kanzler Corp., Elizabeth, N. J. (Asbestos).
Standard Asbestos Mfg. Co., Chicago.
Standard Fuel Engineering Co., Detroit (Rock wood and asbestos).
Tennesse Products Corp., Nashville, Tenn. (Mineral Wool).

Therminsul Corp., Kalamazoo, Mich.
Therminsul Corp., Kalamazoo, Mich.
Thompson & Co., Oakmont (Pittsburgh Dist), Pa.
United States Mineral Wool Co., Chicago (High temperature mineral wool).
Universal Zonolite Insulation Co., Chicago (Vermiculite).
Westinghouse Electric & Manufacturing Co., East Pittsburgh,

• Wilson, Inc., Grant, Chicago (Asbestos).

CEMENT, ROOF

Acme Asbestos Covering & Flooring Co., Chicago.
Acme Refining Co., Cleveland (Liquid and plastic).
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
All States Roofers Equipment & Material Co., Chicago.
American-Marietta Company, Chicago.
Armstrong Co., Detroit.
Barber Asphalt Corp., Barber, N. J.
Barrett Division, Allied Chemical & Die Corporation, New York
City. Barber Asphalt Corp., Barber, N. J.
Barrett Division, Allied Chemical & Die Corporation, New Yor
City.
Bird & Son, Inc., East Walpole, Mass.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, Ohlo,
Carter Paint Co., Liberty, Ind.
Celotex Corp., Chicago.
Certain-teed Products Corp., New York City.
Clinton Metallic Paint Co., Clinton, N. Y.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt).
Johns-Manville, New York City.
Koppers Company, Pittsburgh.
Krehblel Co., J. H., Chicago (Asphaltic, Gilsonite, Elaterite).
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago. Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Midland Paint & Varnish Co., Cleveland (Fiberseal).
Miller & Son, C. Arthur, Elmira, N. Y.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis (Master Asphalt).
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago.
Pecora Paint Co., Philadelphia (Asbestos).
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Rock Fieece Company, El Paso, Texas.
Ruberold Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Smooth-On Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa. Thompson & Co., Oakmont (Pittsburgh Dist.), Pa. · Advertisement in this issue. See Index to Advertisers, page 314.

Tropical Paint & Oil Co., Cleveland. United States Gypsum Co., Chicago. Wilhelm Co., A., Reading, Pa.

crete).

CHAIN, FURNACE

American Chain Div., American Chain & Cable Co., Inc.,

American Chain Div., American Chain & Cyork, Pa.

Bead Chain Mfg. Co., Bridgeport, Conn.
Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
Corbin Screw Corp., New Britain, Conn.
Hart & Cooley Mfg. Co., Holland, Mich.
Hodell Chain Co., Cleveland.
McKay Co., York, Pa.
Russell Mfg. Co., John M., Naugatuck, Conn.
Turner & Seymour Mfg. Co., Torrington, Conn.

CHAMBERS, COMBUSTION, PREFORMED

CHAMBERS, COMBUSTION, FREFORMED

Barclay, Inc., Robert, Chicago.
Chicago Fire Brick Company, Chicago.
Gilbert & Son, Harry E., Bridgeport, Conn. (Radiant Silicons).
Green Fire Brick Company, A. P., Mexico, Mo.
Harvey, Inc., Sid, Valley Stream, N. Y.
McLeod & Henry Co., Inc., Troy, N. Y.
Monogram Combustion Chamber Co., Philadelphia.
Munn and Steele, Inc., Newark, N. J. (Light fired refractory).
Rex Clay Products Company, Detroit.
Universal Zonolite Insulation Co., Chicago (Vermiculite concrete).

CHANNELS

See Angles, Bars, Beams, Channels and Tees (Light Weight Shapes)

CHEMICALS, RUST PREVENTIVE FOR PRETREATING **METALS**

American Chemical Paint Co., Ambler, Pa.
du Pont de Nemours & Co., Inc., E. I., Wilmington, Del.
Nellco Chemical Co., Detroit.
Nellson Chemical Co., Detroit.
North American Fibre Products Co., Cleveland.
Parker Rust-Proof Co., Detroit.
Pennsylvania Salt Mfg. Co., Philadelphia.
Rust Products Co. of America, Chicago.
Rusticide Products Co., Cleveland.
Standard Steel Spring Co., Gary, Ind.
Turco Products, Inc., Los Angeles.
Wolfe-Kote Co., Sheboygan, Wis.

CHIMNEY CAPS

See Caps and Tops, Chimney

CLEANERS FOR STAINLESS STEEL

Pennsylvania Salt Mfg. Co., Philadelphia. Turco Products, Inc., Los Angeles. • United States Steel Supply Co., Chicago.

CLEANERS, POLISHERS AND FINISHERS, METAL (Liquid, Paste and Powder)

du Pont de Nemours & Co., Inc., E. I., Wilmington, Del. NuSteel Company, Chicago.

Pennsylvania Salt Mfg. Co., Philadelphia.

Quigley Company, Inc., New York City (Powder, Cake).

Sonneborn Sons, Inc., L., New York City.

Tamms Silica Company, Chicago. Turco Products, Inc., Los Angeles. Wolfe-Kote Co., Sheboygan, Wis. (Liquid).

CLEANERS, VACUUM, FURNACE

CLEANERS, VACUUM, FURNAC
Baker Furnace & Cleaner Mfg. Co., Toledo, O.

Bissell, Fred, Toledo 2, Ohio.
Breuer Electric Mfg. Co., Chicago.
Clements Mfg. Co., Chicago.
Densmore-Quinlan Co., Kenosha, Wis.
Dickson Coal Co., New York City.

Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Electric Vacuum Cleaner Co., Inc., Cleveland.
Ideal Commutator Dresser Co., Sycamore, Ill.
Kent Co., Inc., Rome, N. Y.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.

National Super Service Co., Toledo, O.
Spencer Turbine Co., Hartford, Conn.

Sturtevant Co., B. F., Hyde Park, Boston.

• Sturtevant Co., B. F., Hyde Park, Boston.

CLEAT BENDERS See Machines, Cleat Bending

CLIPS, FASTENING, FOR ROOFING

American Sheet Metal Works, New Orleans, La. Bard Manufacturing Co., Bryan, O.

Berger Brothers Co., Philadelphia.
Bridesburg Foundry Co., Philadelphia.
Diamond Expansion Bolt Co., Inc., Garwood, N. J. Edwards Mfg. Co., Inc., Cincinnati.
Milcor Steel Co., Minwaukee.

Osborn Co., J. M. & L. A., Cleveland.
Pfeifer, Wm., New York City.
Southbridge Roefing Co., Inc., Southbridge Maga

Southbridge Roofing Co., Inc., Southbridge, Mass.

CLIPS AND TIPS, DAMPER

Adams Company, The, Dubuque, Iowa.
Alr Control Products, Inc., Coopersville, Mich.
Berger Bros. Co., Philadelphia.
Gerett Co., M. A., Milwaukee.
Goese Mfg. Co., Milwaukee.
Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Griswold Mfg. Co., Erie, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Howes-Woods Company, Cambridge, Mass.
Kerentoff, G. L. Cincinnati

Howes-Woods Company, Cambridge, Mass.
Kerentoff, G. L., Cincinnati.

Meyer & Bro., Co. F., Peoria, Ill.
Milcor Steel Co., Milwaukee.

Mueller Furnace Co., L. J., Milwaukee.
Schoedinger, F. O., Columbus, Ohio.

United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland.

CLOTH AND NETTING, WIRE

Buffalo Wire Works Company, Buffalo. Chase Brass & Copper Co., Incorporated, Waterbury, Conn. Wickwire Spencer Steel Co., New York City. Cyclone Fence Division, American Steel & Wire Co., Waukegan.

CO₂ ANALYZERS See Analyzers, CO₃

COAL BURNERS, AUTOMATIC

See Stokers

COILS, COOLING, DIRECT EXPANSION, FINNED

Aerofin Corp., Syracuse, N. Y.
Airtemp Div., Chrysler Corp., Dayton, Ohio.
American Coils, Inc., Newark, N. J.
Beacon-Morris Corp., Boston, Mass.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Incorporated. Waterbury, Conn.
Chicago Metal Hose Corporation, Maywood, Ill.
Conditionaire Unit Co., Chicago.
Drayer-Hanson, Inc., Los Angeles.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Div., General Motors Corp., Dayton, Ohio.
G & O Mfg. Co., New Haven, Conn.
General Electric Co., Bloomfield, N. J.
General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

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Griscom-Russell Co., The, New York City.
Kauffman Air Conditioning Corp., St. Louis.
Kennard, Inc., Sam, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McCord Radiator & Mfg. Co., Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Marlo Coil Co., St. Louis.
Mojonnier Brothers Co., Chicago.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Company, New York City.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, O.
Reliance Refrigerating Machine Co., Chicago.
Rempe Co., Chicago.

Reliance Refrigerating Machine Co., Chicago.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Galvanizing Co., Chicago.
Sturtevant Company, B. F., Hyde Park, Boston.
Super Radiator Corp., Minneapolis.
Tilco-Fin, Inc., Brooklyn.
Trane Co., La Crosse, Wis.
Vilter Mfg. Co., Milwaukee.
Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.

Company, Detroit.

X L Refrigerating Company, Inc., Chicago.
York Corp., York. Pa.
Young Radiator Co., Racine, Wis.

COILS, COOLING, WATER

Aerofin Corp., Syracuse, N. Y.
Airtemp Div., Chrysler Corp., Dayton, Ohio.
American Coils, Inc., Newark, N. J.
Beacon-Morris Corp., Boston.
Bell & Gossett Co., Morton Grove, Ill.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Company, Chicago.
Draver-Hanson. Inc., Los Angeles. Drayer-Hanson, Inc., Los Angeles.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Division, General Motors Corporation, Dayton, O. G & O Mfg. Co., New Haven, Conn.

General Electric Co., Bloomfield, N. J. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Griscom-Russell Co., The, New York City.
Industrial Mfg. & Eng. Co., Chicago.
Johnson Fan & Blower Corp., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard, Inc., Sam, St. Louis.
Kennard, Inc., Sam, St. Louis.
Kramer Trenton Co., Trenton, N. J.
Larkin Colis, Inc., Atlanta, Ga.
McCord Radiator & Mfg. Co., Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Mario Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Mojonnier Brothers Co., Chicago.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia.
Niagara Blower Company, New York City.
Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago.
Roessing Mfg. Co., Sharpsburg Sta., Pittsburgh.
Rome-Turney Radiator Co., Rome, N. Y.
Standard Galvanizing Co., Chicago.
Standard Heater & Oil Equipment Co., Jersey City, N. Y.
Sturtevant Company, B. F., Hyde Park, Boston.
Super Radiator Corp., Minneapolis.
Tilco-Fin, Inc., Brooklyn.
Trane Co., La Crosse, Wis.
Vilter Mfg. Co., Milwaukee.
Wing Manufacturing Co., L. J., New York City.
Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.
X L Refrigerating Co., Inc., Chicago. General Refrigeration Div., Yates-American Machine Co., Be-

Wolverine Tube Div., Calumet and R. Company, Detroit.

X L Refrigerating Co., Inc., Chicago. York Corp., York, Pa.

Young Radiator Co., Racine, Wis.

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COILS, FIRE POT, HOT WATER

COILS, FIRE POT, HOT WATER

Adams Company, The, Dubuque, Iowa.
Air Controls, Inc., Cleveland.
Brauer Supply Co., A. G., St. Louis.
Deshler Foundry & Machine Works, Deshler, O.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Globe Machinery & Supply Co., Des Moines, Ia.
Harvey-Whipple, Inc., Springfield, Mass.
Hotstream Heater Co., Cleveland.
Kitson Co., Philadelphia.
Lennox Furnace Co., Marshall, Mich.
Miller & Son, C. Arthur, Elmira, N. Y.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee.
Murray Mfg. Co., D. J., Wausau, Wis.
National Iron Works, San Diego, Calif.
Radiator Specialty Co., Charlotte, N. C.
Rempe Co., Chicago.
Rome-Turney Radiator Co., Rome, N. Y.
Rudy Furnace Co., Dowagiac, Mich.

Rudy Furnace Co., Dowagiac, Mich. Taco Heaters, Inc., New York City.

COILS, HEATING

COILS, HEATING

Aerofin Corp., Syracuse, N. Y.
American Coils, Inc., Newark, N. J.
Bayley Blower Co., Milwaukee.
Beacon-Morris Corporation, Boston.
Betz Corporation, Hammond, Ind.
Bohn Aluminum & Brass, Detroit.
Bush Mfg. Co., Hartford, Conn.
Campbell Heating Co., E. K., Kansas City, Mo.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conditionaire Unit Company, Chicago.
Drayer-Hanson, Inc., Los Angeles.
Fedders Mfg. Co., Inc., Buffalo.
Frigidaire Division, General Motors Corporation, Dayton, O.
G & O Mfg. Co., New Haven, Conn.
General Electric Co., Bloomfield, N. J.
Griscom-Russell Co., New York City.
Industrial Mfg. & Eng. Co., Chicago.
Johnson Fan & Blower Corp., Chicago.
Kauffman Air Conditioning Corp., St. Louis.
Kennard, Inc., Sam, St. Louis.
Kramer Trenton Co., Trenton, N. J.
McCord Radiator & Mfg. Co., Detroit.
McQuay, Inc., Minneapolis.
Manufacturer's Fin Coil Co., Chicago.
Marlo Coil Co., St. Louis.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Waussu, Wis.
Nesbitt, Inc., John J., Philadelphia.
New York Blower Co., Chicago.
Niagara Blower Co., Chicago.
Niagara Blower Co., New York City.
Peerless of America, Inc., Marion, Indiana.
Refrigeration Appliances, Inc., Chicago.
Refrigeration Economics Co., Inc., Canton, Ohio.
Rempe Co., Chicago.
Roessing Manufacturing Co., Pittsburgh. Rempe Co., Chicago.
Roessing Manufacturing Co., Pittsburgh.

Rome-Turney Radiator Co., Rome, N. Y.
Standard Heater and Oil Equipment Co., Jersey City.
Sturtevant Co., B. F., Hyde Park, Boston.
Super Radiator Corp., Minneapolis. Super Radiator Corp., Minneapolis.
Trilco-Fin, Inc., Brooklyn.
Trane Co., La Crosse, Wis.
Wing Mfg. Co., L. J., New York City.
Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

COLLECTORS, BLOW PIPE

Allen Billmyre Co., Mamaroneck, N. Y.
Allington & Curtis Mfg. Co., Saginaw, Mich.

• American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., Detroit.
American Foundry Equipment Co., Mishawaka, Ind.
American Metal Products Co., Fort Worth, Texas.

• Bayley Blower Co., Milwaukee.
Blower Application Co., Miwaukee.
Bubar, Hudson, H., New York City.
Buffalo Forge Co., Buffalo.
Clark Forge Co., Eufalo.
Clark Foust Control Company. Chicago.

Clark Dust Control Company, Chicago.

Day Co., Minneapolis.

Dracco Corp., Cleveland.

Garden City Fan Co., Chicago.

Goethel Sheet Metal Works, Alfred, Milwaukee.

Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids,

Mich. Mich.

Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.

Jacobs Co., B. & J., Cincinnati.

Kirk & Blum Mfg. Co., Cincinnati.

Kirk & Blum Mfg. Co., Cincinnati.

Kinegel & Co., E., St. Paul, Minn.

Knickerbocker Co., Jackson, Mich.

Kopperman & Sons, Joseph, Philadelphia.

Lehigh Fan & Blower Co., Allentown, Pa. (fly ash).

New York Blower Co., Chicago.

Northern Blower Co., Cleveland.

Pangborn Corp., Hagerstown, Md.

Peters-Dalton, Inc., Detroit.

Puhl & Hepper Mfg. Co., Inc., St. Louis.

Research Corp., New York City.

Ruemelin Mfg. Co., Milwaukee.

Schmieg Industries, Detroit.

Skinner Heating & Vent Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.

Sly Mfg. Co., W. W., Cleveland.

Spencer Turbine Co., Hartford, Conn.

Steinhorst & Sons, Inc., Emil, Utica, N. Y.

Strandwitz & Co.. Inc., W. J., Camden, N. J.

Sturtevant Co., B. F., Hyde Park, Boston.

Torit Manufacturing Co., St. Paul, Minn.

Western Blower Co., Seattle, Wash.

Western Precipitation Corp., Los Angeles.

Whiting Corporation, Harvey, Ill.

Winkler & Sons, Inc., A. E., Milwaukee.

Young & Bertke Co., Cincinnati.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMPOUNDS, CAULKING

Accurate Metal Weather Strip Co., New York City.
Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Company, Cleveland.
Allmetal Weatherstrip Co., Chicago.
Alpha Metal & Rolling Mills, Inc., Brooklyn.
American-Marietta Company, Chicago.

Alpha Metal & Rolling Mills, Inc., Brooklyn.
American-Marietta Company, Chicago.
American Metal Weather Strip Co., Grand Rapids, Mich.
Armstrong Co., Detroit.
Asphalt Products Co., Inc., Syracuse, N. Y.
Barber Asphalt Corporation, Barber, N. J.
Barland Weatherstrip Material Co., Cleveland.
Calbar Paint & Varnish Co., Philadelphia.

Carey Co., Philip, Lockland, Ohio.
Carter Paint Co., Liberty, Ind.
Chamberlin Metal Weatherstrip Co., Detroit.
Clinton Metallic Paint Co., Clinton, N. Y.
Continental Products Co., Euclid, O.
Fintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Company, Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Johns-Manville, New York City.
Krehbiel Co., J. H., Chicago.
Lastik Products Co., Inc., Pittsburgh.
Lehon Company, Chicago.
Maas and Waldstein Co., Newark, N. J.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
Mortell Co., J. W., Kankakee, Ill.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Cleveland.
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago (Asphalt).
Pecora Paint Co., Philadelphia.
mdex to Advertisers, page 314.

Advertisement in this issue. See Index to Advertisers, page 314.

Pittsburgh Plate Glass Co., Pittsburgh.
Plastic Products Co., Detroit.
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Quigley Company, Inc., New York City.
Radiator Specialty Co., Charlotte, N. C.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Company, James B., Pittsburgh.
Smooth-on Mfg. Co., Jersey City, N. J.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Company, Savannah, Ga.
Tamms Silica Company, Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
U. S. Stoneware Company, Akron, Ohio, and New York City.
Wilhelm Co., A., Reading, Pa.
X-Pando Corp., Long Island City, N. Y.
Yardley Venetian Blind Co., Columbus, Ohio.

COMPOUNDS, GLAZING

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Company, Cleveland.
Armstrong Co., Detroit.
Calbor Paint & Varnish Co., Philadelphia. Chamberlin Metal Weather Strip Co., Detroit. Continental Products Co., Euclid, O. Continental Products Co., Euclid, O.
Glidden Company, Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Lastik Products Co., Inc., Pittsburgh.
Midland Paint & Varnish Co., Cleveland.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Company, Pittsburgh.
Plastic Products Co., Detroit.
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Company, Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
X-Pando Corporation, Long Island City, N. Y.

COMPOUNDS, TINNING

Alpha Metal & Rolling Mills, Inc., Brooklyn.
American Solder & Flux Co., Philadelphia.
Burnley Battery & Mfg. Co., North East, Pa.
Eagle-Picher Lead Co., Cincinnati.
Lukens Metal Co., Thos. F., Philadelphia.
Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
Motex Metal Process Corporation, Detroit.
Potomac Mfg. Co., Philadelphia.

Ruby Chemical Co., Columbus, O.
Turco Products, Inc., Los Angeles.

COMPOUNDS, WATER-PROOFING

Acme White Lead & Color Works, Detroit. Acorn Refining Co., Cleveland.
Asphalt Products Co., Inc., Syracuse, N. Y.
Baldwin-Hill Company, Trenton, N. J.
Barber Asphalt Corp., Barber, N. J. Barrett Division, Allied Chemical & Die Corporation, New York City.

Barrett Division, Allied Chemical & Die Corporation, N. City.

Belmont Smelting & Refining Works, Inc., Brooklyn.

Carey Co., Philip, Lockland, Ohio.
Continental Products Co., Euclid, Ohio.
Flintkote Co., New York City.
Ford Roofing Products Company, Chicago.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., The, Cleveland.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Johns-Manville, New York City.
Koppers Co., Pittsburgh.
Lastik Products Co., Inc., Pittsburgh.
Nebel Manufacturing Co., Cleveland.
North American Fibre Products Co., Cleveland.
Pecora Paint Co., Philadelphia.
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh (Processed Asphalt).
Saucreisen Cements Co., Sharpsburg, Pa.
Self-Vulcanizing Rubber Co., Inc., Chicago.
Sherwin-Williams Co., Cleveland.
Sipe & Company, James B., Pittsburgh.
Smooth-On Mfg. Co., Jersey City, N. J.
Scnneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Walles Dove-Hermiston Corporation, Westfield, N. J.
Wilhelm Co., A., Reading, Pa. Wilhelm Co., A., Reading, Pa. X-Pando Corp., Long Island City, N. Y.

COMPOUNDS, WELDING

Acme White Lead & Color Works, Detroit. American Solder & Flux Co., Philadelphia. Midland Paint & Varnish Co., Cleveland. Turco Products, Inc., Los Angeles. Universal Power Corporation, Cleveland. Wolfe-Kote Co., Sheboygan, Wis.

COMPRESSORS, REFRIGERATING

COMPRESSORS, REFRIGERATING

Air Conditioning and Refrigeration Div., Worthington Pump & Machinery Corp., Harrison, N. J.

Airtemp Division Chrysler Corp., Dayton, Ohio.

Baker Ice Machine Co., Inc., Omaha, Nebr.

Brunner Mfg. Co., Utica, N. Y.

Carrier Corp., Syracuse, N. Y.

Copeland Refrigeration Corp., Sidney, Ohio.

Curtis Refrigerating Machine Co., St. Louis.

Diceler Corp., Gasport, N. Y.

Fairbanks, Morse & Co., Chicago.

Frick Co., Waynesboro, Pa.

Frigidaire Division, General Motors Corporation, Dayton, O.

Gale Products, Galesburg, Ill.

General Electric Co., Bloomfield, N. J.

General Electric Co., Bloomfield, N. J. General Machinery Co., Spokane, Wash. (Ammonia). General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

Wis.

Howe Ice Machine Co., Chicago.

Ingersoll-Rand, New York City.

Kauffman Air Conditioning Corp., St. Louis.

Kelvinator Div., Nash-Kelvinator Corp., Detroit.

Merchant & Evans Co., Philadelphia.

Mills Novelty Co., Chicago.

Phoenix Ice Machine Co., Cleveland.

Reliance Refrigerating Machine Co., Chicago.

Reynolds Manufacturing Co., Springfield, Mo.

Servel. Inc.. Evansville, Ind.

Reynolds Manufacturing Co., Springfield, Mo.
Servel, Inc., Evansville, Ind.
Starr Piano Co., Richmond, Ind.
Stewart Ice Machine Co., Los Angeles.
Tecumseh Products Co., Tecumseh, Mich.
Trane Co., La Cross, Wis.
Universal Cooler Corp., Marion, Ohio.
Vilter Mfg. Co., Milwaukee.
Williams Oil-O-Matic Heating Corp., Bloomington, Ill.
Wittenmeler Machinery Co., Chicago.
X L Refrigerating Co., Chicago.
Yeomans Brothers Co., Chicago.
York Corp, York, Pa.

CONDUCTOR PIPE

See Pipe, Conductor

CONNECTIONS, DUCT, FLEXIBLE (Asbestos, Canvas, etc.)

Canvas Products Co., St. Louis. Carpenter & Co., Geo. B., Chicago. Felters Co., Inc., The, Boston. United States Rubber Co., New York City. Wilson, Inc., Grant, Chicago (Asbestos).

CONNECTORS, METAL, FOR SUBSTITUTE DUCTS Lumm Co., A. H., Toledo, Ohio. • Sheetlock Co., Chicago.

CONNECTORS, WOOD, FOR SUBSTITUTE DUCTS Klomparens Lock-Joint Co., Bethesda 14, Md.

CONTROL SYSTEMS, FORCED AIR FURNACE,

CONTROL SYSTEMS, FORCED AIR FURNACE,
HAND-FIRED (PACKAGE)
(Bonnet Control of Blower)
Barclay, Inc., Robert, Chicago.
Cook Electric Co., Chicago.
Mercoid Corporation, Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
Sampsel Time Control, Inc., Spring Valley, Ill.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Company, Attleboro, Mass.
White Manufacturing Co., St. Paul, Minn.

CONTROL SYSTEMS, FORCED AIR FURNACE, HAND-FIRED (PACKAGE) (Thermostat Control of Blower)

Cook Electric Co., Chicago.

General Controls Co., Glendale, Calif.

Mercold Corp., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Penn Electric Switch Co., Goshen, Ind.

Perfex Corporation, Milwaukee.

Sammed Time Control Los, Spring Valley, Ill. Sampsel Time Control, Inc., Spring Valley, Ill. Schwab Safe Co., Lafayette, Ind. Spencer Thermostat Company, Attleboro, Mass.

White Manufacturing Co., St. Paul, Minn.

White-Rodgers Electric Co., St. Louis.

Advertisement in this issue. See Index to Advertisers, page 314.

CONTROL SYSTEMS, GRAVITY FURNACE, HAND-FIRED (PACKAGE)

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1944

FIRED (PACKAGE)

Automatic Products Co., Milwaukee.
Cook Electric Co., Chicago.
Defender Automatic Regulator Co., St. Louis.
General Controls Co., Glendale, Calif.
Gleason-Avery, Inc., Auburn, N. Y.
Mercoid Corp., Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio.
Sampsel Time Control, Inc., Spring Valley, Ill.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Company, Attleboro, Mass.
White Manufacturing Co., St. Paul, Minn.

CONTROL SYSTEMS, ZONE DISTRIBUTION, COMPLETE

Au-Temp-Co Corp., New York City. Barber-Colman Company, Rockford, Ill. Cook Electric Co., Chicago. Mercoid Corp., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis. Sampsel Time Control, Inc., Spring Valley, Ill.

CONTROLS, COMBINED FAN AND LIMIT, LINE VOLTAGE

Defender Automatic Regulator Co., St. Louis.

Defender Automatic Regulator Co., St. Louis.

Detroit Lubricator Co., Detroit.

Mercoid Corp., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, Ohio, Schwab Safe Co., Lafayette, Ind.
United Electric Controls Co., South Boston, Mass.

White-Rodgers Electric Co., St. Louis.

CONTROLS, COMBINED FAN AND LIMIT, LOW **VOLTAGE**

Cook Electric Co., Chicago.

Cook Electric Co., Chicago.
Defender Automatic Regulator Co., St. Louis.

Detroit Lubricator Co., Detroit.

Mercoid Corp., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Schwab Safe Co., Lafayette, Ind.

White Manufacturing Co., St. Paul, Minn.

White-Rodgers Electric Co., St. Louis.

CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LINE VOLTAGE

Barber-Colman Co., Rockford, Ill.
Cook Electric Co., Chicago.
Detroit Lubricator Co., Detroit.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Microold Corporation, Chicago.

 Minneapolis-Honeywell Regulator Co., Minneapolis. Perfex Corporation, Milwaukee. Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.

CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE, LOW VOLTAGE

Cook Electric Co., Chicago.

Detroit Lubricator Co., Detroit.

Mercoid Corporation, Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.

White Manufacturing Co., St. Paul, Minn.

CONTROLS, EFFECTIVE TEMPERATURE

Barber-Colman Co., Rockford, Ill.

Friez Instrument Division, Towson, Md.
Fulton Sylphon Co., Knoxville, Tenn.

Mercold Corporation, Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Tagliabue Mfg. Co., C. J., Brooklyn.

CONTROLS, FAN, LINE VOLTAGE

Allen-Bradley Co., Milwaukee.

Arrow-Hart & Hegeman Electric Co., Hartford, Conn. Barber-Colman Co., Rockford, Ill. Clark Controller Co., Cleveland. Cook Electric Co., Chicago

Detroit Lubricator Co., Detroit.
 General Controls Co., Glendale, Calif.
 Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
 Mercold Corporation, Chicago.
 Minneapolis-Honeywell Regulator Co., Minneapolis.
 Dearson, Floring Co., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis. Paragon Electric Co., Chicago.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Ranco, Inc., Columbus, O.
Sampsel Time Control. Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
White-Rodgers Electric Co., St. Louis.

CONTROLS, FAN, LOW VOLTAGE

Allen-Bradley Co., Milwaukee. Arrow-Hart & Hegeman Electric Co., Hartford, Conn. Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Barber-Colman Co., Rockford, Ill.
Clark Controller Co., Cleveland.
Cook Electric Co., Chicago.
Detroit Lubricator Co., Detroit.
General Controls Co., Glendale, Calif.
Gleason-Avery, Inc., Auburn, N. Y.
McCorkle Co., D. H., Berkeley, Calif.
Mercoid Corp., Chicago.
Mimneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
White Manufacturing Co., St. Paul, Minn.
White-Rodgers Electric Co., St. Louis.

• White-Rodgers Electric Co., St. Louis

CONTROLS, HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, PNEUMATIC

American Schaeffer & Budenberg Instrument Div., Manning. Maxwell & Moore, Inc., Bridgeport, Conn. Atlas Valve Co., Newark, N. J. Bristol Co., Waterbury, Conn. Foxboro Co., Foxboro, Mass.

Foxforo Co., Foxforo, Mass.
Fulton Sylphon Co., Knoxville, Tenn.
Johnson Service Co., Milwaukee.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Powers Regulator Co., Chicago.
Sampsel Time Control, Inc., Spring Valley, Ill.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

CONTROLS, LIMIT, LINE VOLTAGE

Allen-Bradley Co., Milwaukee.
Cook Electric Co., Chicago.
Detroit Lubricator Co., Detroit.
General Electric Co., Schenectady, N. Y.
Gleason-Avery, Inc., Auburn, N. Y.
Hart Manufacturing Co., Hartford, Conn.
Mercoid Corporation, Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., 1 Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.

White Manufacturing Co., St. Paul, Minn.

White-Rodgers Electric Co., St. Louis.

CONTROLS, LIMIT, LOW VOLTAGE

Allen-Bradley Co., Milwaukee

Allen-Bradley Co., Milwaukee.

Automatic Products Co., Milwaukee.
Cook Electric Co., Chicago.

Detroit Lubricator Co., Detroit.
General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Gleason-Avery, Inc., Auburn, N. Y.
McCorkle Co., D. H., Berkeley, Calif.
Mercold Corp., Chicago.
Minneapolis-Honeywall Regulator Co. Mi

Mercoid Corp., Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Co., Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.
White Manufacturing Co., St. Paul, Minn.
White-Rodgers Electric Co., St. Louis.

· Advertisement in this issue. See Index to Advertisers, page 314.

CONTROLS, OIL BURNER, COMPLETE ASSEMBLY

Au-Temp-Co Corp., New York City.

Automatic Products Co., Milwaukee.
Defender Automatic Regulator Co., St. Louis.
Detroit Lubricator Co., Detroit.
General Controls Co., Glendale, Calif.
Mercoid Corporation, Chicago.

 Minneapolis-Honeywell Regulator Co., Minneapolis.
 Penn Electric Switch Co., Goshen, Ind.
 Perfex Corporation, Milwaukee. Schwab Safe Co., Lafayette, Ind.

CONTROLS, STOKER, COMPLETE ASSEMBLY

Au-Temp-Co Corp., New York City.
Defender Automatic Regulator Co., St. Louis.

Detroit Lubricator Co., Detroit.
Gleason-Avery, Inc., Auburn, N. Y.
Mercoid Corporation, Chicago, Ill.

· Minneapolis-Honeywell Regulator Co., Minneapolis.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Palmer Electric Co., Chicago.
Paragon Electric Co., Chicago.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation. Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
White-Rodgers Electric Co., St. Louis.

CONTROLS, WINDOW CONDENSATION

Friez Instrument Div., Towson, Md.

COOLING SURFACE

See Coils, Cooling, Water

COPPERS, SOLDERING

COPPERS, SOLDERING

American Brass Co., Waterbury, Conn.
Bernz Co., Otto, Rochester, N. Y.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Clendenin Brothers, Inc., Baltimore.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Dual Remote Control Co., Wayne, Mich.
Electric Materials Co., North East, Pa.
Electric Soldering Iron Co., Inc., Deep River, Conn. (Electric)
Everhot Mfg. Co., Maywood, Ill.
General Electric Co., Schenectady, N. Y.
Hexacon Electric Co., Roselle Park, N. J.

Hussey & Co., C. G., Pittsburgh.
Ideal Cummutator Dresser Co., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago.
Lenk Mfg. Co., Newton Lower Falls, Mass.
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
Parker-Kalon Corp., New York City.
Peck, Stow & Wilcox Co., Southington, Conn.
Reiner & Campbell Co., Inc., Elizabeth, N. J. (Carbide)
Revere Copper & Brass, Inc., New York City.
Sheet Metal Mfg. Co., Brooklyn.
Slght Feed Generator Co., Richmond, Ind.
Stanley Tools, New Britain, Conn.
Sta-Warm Electric Co., Ravenna, O.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Vulcan Electric Co., Danvers, Mass.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Weiss & Co., H., New York City.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Couplings Co., Westfield, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee.
American Flexible Coupling Co., Erie, Pa.
Bartlett Hayward Co., Baltimore.
Blood Brothers Machine Co., Allegan. Mich. (Universal joints)
Boston Gear Works, Inc., North Quincy, Mass.
Browning Manufacturing Co., Inc., Maysville, Ky.
Caldwell Co., W. E., Louisville, Ky.
Certified Flexible Couplings, New York City.
Chain Belt Co., Milwaukee. Caldwell Co., W. E., Louisville, Ky.
Certified Flexible Couplings, New York City.
Chain Belt Co., Milwaukee.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit.
Continental Diamond Fibre Co., Newark, Del.
Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Diamond Chain & Mfg. Co., Indianapolis.
Dodge Mfg. Co., Mishawaka, Ind.
Flexo Supply Co., Inc., St. Louis, Mo.
Guardian Utilities Co., Michigan City, Ind.
Jones Foundry Machine Co., W. A., Chicago.
Link-Belt Co., Chicago.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago.
Medart Co., St. Louis.
Mercury Clutch Corporation, Canton, O.
Moran Flexible Steam Joint Co., Louisville, Ky.
Morse Chain Co., Ithaca, N. Y.
Poole Foundry & Machine Co., Baltimore.
Shallcross Co., Philadelphia.

Smith, Inc., Winfield H., Springville, N. Y.
Stewart-Rogers, Inc., Philadelphia.
Stow Mfg. Co., Inc., Binghamton, N. Y.
Thermoid Rubber Div. of Thermoid Co., Trenton, N. J.
United States Rubber Co., New York City.
Waldron Corp., John, New Brunswick, N. J.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Whitney Chain & Mfg. Co., The, Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

CRIMPING MACHINES

See Machines, Crimping

DAMPER MOTORS

See Motors, Damper, Furnace Draft, Electrical

DAMPER CONTROLS

See Regulators, Damper Sets

DAMPER REGULATOR SETS

See Regulators, Damper Sets

DAMPERS, FOR WARM AIR PIPE

• Adams Co., Dubuque, Ia.

Adams Co., Dubuque, Ia.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y. (Tin)
Lennox Furnace Co., Marshalltown, Ia.
Meyer & Bro. Co., F., Peoria, Ill.
Peerless Foundry Co., Inc., Indianapolis.
Sheet Metal Mfg. Co., Inc., Brooklyn.
United States Register Co., Battle Creek, Mich.

DAMPERS, SMOKE PIPE

Adams Co., The, Dubuque, Ia.
Brauer Supply Co., A. G., St. Louis, Mo.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Char-Gale Mfg. Co., Minneapolis.
Dickson Coal Co., New York City.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Eselgroth & Co., Newark, N. J.
Forest City Foundries Co., Niagara Furnace Div., Cleveland
(Cheek Demos)

Forest City Foundries Co., Niagara Furnace Div., Cleveland (Check Damper)
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grand Rapids Die & Tool Co., Grand Rapids, Mich. Griswold Mfg. Co., Erie, Pa.
Hotstream Heater Co., Cleveland. Juniper Elbow Co., Inc., Middle Village, L. I., N. Y. (Cast Iron) Keith Furnace Co., Des Moines, Ia. Maple City Furnace Co., Monmouth, Ill.
Meyer & Bro. Co., F., Peoria, Ill. Milcor Steel Co., Milwaukee.
Mueller Furnace Co., L. J., Milwaukee.
Peerless Foundry Co., Inc., Indianapolis. Preferred Utilities Manufacturing Corp., New York City. Royal-Apex Mfg. Corp., Brooklyn.

Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, O.,
Sheet Metal Mfg. Co., Inc., Brooklyn.
United States Register Co., Battle Creek, Mich.
Walker Mfg. & Sales Corp., St. Joseph, Mo.
Williamson Heater Co., Cincinnati.

DAMPERS, STACK HEAD

Air Conditioning Products Co., Detroit, Barber-Colman Co., Rockford, 1ll. Controlair, Inc., Elyria, O. Richmond Radiator Co., Inc., Uniontown, Pa. Richmond Radiator Co., Inc., Uni Young Regulator Co., Cleveland.

DIES

See Presses and Dies

DIFFUSERS, AIR, HIGH VELOCITY

A-J Manufacturing Co., Kansas City, Mo. Air Devices, Inc., New York City. Anemostat Corporation of America, New York City. Anemostat Corporation of America, New York City.

Barber-Colman Co., Rockford, Ill.

Connor Eng. Corp., New York City. (High Velocity)

Demuth & Sons, Charles, Mineola, L. I., N. Y.

Dynamic Air Engineering, Inc., Los Angeles.

Guth Co., Edwin F., St. Louis. (Ventilating, Diffusing, Terminals) nals)

• Tuttle & Bailey, Inc., New Britain, Conn. Waterloo Register Co., Waterloo, Ia. Wilster Air Devices, Inc., Cleveland.

DOORS, HOLLOW METAL

Advance Insulating Co., Pittsburgh.
American Sheet Metal Works, New Orleans.
Bayer Co., A. J., Los Angeles.
Biersach & Niedermeyer Co., Milwaukee.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Decatur Iron & Steel Co., Decatur, Ala.
Detroit Steel Products Co., Detroit.

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Edwards Mfg. Co., Inc., Cincinnati.
International Steel Co., Evansville, Ind.
Jamestown Metal Corp., Jamestown, N. Y.
Kawneer Co., Niles, Mich.
Maysteel Products, Inc., Mayville, Wis.
Metal Door & Trim Co., La Porte, Ind.
Newman Brothers, Inc., Cincinnati.
Parkingen & Brown, Chicago Perkinson & Brown, Chicago. Richmond Fireproof Door Co., Richmond, Ind. Truscon Steel Co., Youngstown, O.

DOORS, KALAMEIN

American Sheet Metal Works, New Orleans.
Biersach & Niedermeyer Co., Milwaukee.
Cincinnati Mfg. Co., Cincinnati.
Dusing & Hunt, Inc., Buffalo.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Mahon Co., R. C., Detroit.
Mesker & Co., Geo. L., Evansville, Ind.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Newman Brothers, Inc., Cincinnati.
Perkinson & Brown, Chicago.
Richmond Fireproof Door Co., Richmond, Ind.
Syracuse Fire Door Corp., Syracuse, N. Y.

DOORS AND SHUTTERS, FIRE
American Sheet Metal Works, New Orleans.
Bardes Range & Foundry Co., E. H., Cincinnati.
Biersach & Niedermeyer Co., Milwaukee.
Cornell Iron Works, Inc., Long Island City, N. Y.
Detroit Steel Products Co., Detroit.
Dusing & Hunt, Inc., Buffalo.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Door Co., Inc., New York City.
Falstrom Co., Passaic, N. J.
Gebri Co., Tacoma, Wash.
Herrmann & Grace Co., Brooklyn.
International Steel Co., Evansville, Ind.
Jamar Co., Walker, Duluth, Minn.
Kinnear Mfg. Co., Columbus, O.
Mahon Co., R. C., Detroit.
Maysteel Products, Inc., Mayville, Wis.
Merchant & Evans Co., Philadelphia.
Mesker & Co., Geo. L., Evansville, Ind.
Meyer Manufacturing Co., Detroit.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Perkinson & Brown, Chicago.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Richmond Fireproof Door Co., Richmond, Ind.
Saino Mfg. Co., Inc., F. L., Memphis, Tenn.
Syracuse Fire Door Corp., Syracuse, N. Y.
Western Wire & Iron Works, Inc., Chicago.
Willis Steel Corporation, Galesburg, Ill.

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DRAFT GAGES See Gages, Draft

DRAFT REGULATORS See Regulators, Furnace Draft, Mechanical

DRILLS, ELECTRIC, PORTABLE

Albertson & Co., Inc., Sioux City, Iowa.

Black & Decker Mfg. Co., Towson, Md.

Buckeye Portable Tool Co., Dayton, O.

Chicago Pneumatic Tool Co., New York City.

Cincinnati Electrical Tool Co., Cincinnati.

Clark, Jr., Electric Co., Jas., Louisville, Ky.

Duro Metal Products Co., Chicago.

Independent Pneumatic Tool Co., Chicago.

Keller, Inc., Wm. H., Grand Haven, Mich. (Pneumatic)

Mall Tool Co., Chicago.

Millers Falls Co., Greenfield, Mass.

Misener Mfg. Co., Inc., Syracuse, N. Y.

Paramount Products Co., New York City.

Power King Tool Corp., Warsaw, Ind.

Signal Electric Mfg. Co., Menominee, Mich.

Skilsaw, Inc., Chicago.

Snap-On Tools Corp., Kenosha, Wis.

Speedway Mfg. Co., Cicero, Ill.

Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.

Conn.
Syntron Co., Homer City, Pa.
United States Electrical Tool Co., Cincinnati.
Van Dorn Electric Tool Co., Towson, Md.
Willy's Carbide Tool Co., Detroit.
Wodack Electric Tool Corp., Chicago. (Combination Hammer

and Drill) York Electric and Machine Company, York, Pa.

DRIVES, STOKER
Butler Street Foundry & Iron Co., Chicago.
Davy Fuel & Supply Co., Stoker Div., Detroit.
Malco Gear Co., Dolton, Ill.
Merkle-Korff Gear Co., Chicago.
Independent Pneumatic Tool Co., Chicago.
Stokewist Corp. Milwankee Stokerunit Corp., Milwaukee.

DUCT CONNECTIONS See Connections, Duct, Flexible

DUCT INSULATION

See Insulation, Duct

DUCT TURNING VANES See Vanes, Duct Turning

DUCTS AND DUCT FITTINGS, PREFABRICATED

DUCTS AND DUCT FITTINGS, PREFABRIC

Acer & Whedon, Inc., Medina, N. Y.

Acme Tin Plate & Roofing Supply Co., Philadelphia.

Adelta Manufacturing Co., Philadelphia.

Carey Co., Philip, Lockland, O. (Asbestos)
Champion Furnace Pipe Co., Peoria, Ill.
Chandler Co., Cedar Rapids, Ia.
Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Corbman Bros., Inc., Philadelphia.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Gehri Co., Tacoma, Wash.

General Heating Products Co., Minneapolis.
Gray Metal Products, Inc., Rochester, N. Y.

Henry Furnace Co., Medina, O.

Howes-Woods Co., Cambridge, Mass.

International Heater Co., Utica, N. Y.
Jacobs Co., B. & J., Cincinnati.
Knight, Maurice A., Akron, O. (Acid Fumes)
Lamneck Products, Inc., Middletown, O.

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee.
Moncrief Furnace Co., L. J., Milwaukee.

Milcor Steel Co., Milwaukee.

Moncrief Furnace Co., Atlanta, Ga.

Mueller Furnace Co., L. J., Milwaukee.
Richmond Radiator Co., Inc., Uniontown, Pa.
Schecter Brothers Co., Philadelphia.
Season-Aire Corporation of America, Detroit.
Standard Furnace & Supply Co., Omaha, Nebr.
United States Register Co., Battle Creek, Mich.
Waterman-Waterbury Co., Minneapolis.

Williamson Heater Co., Cincinnati.
Wood Industries, Inc., Gar, Detroit.

DUCTS, PREFABRICATED, NOT METAL

Detroit Gasket & Mfg. Co., Detroit.

Dutton Asbestos & Supply Co., 532 Natoma St., San Francisco. (Pre-insulated). Smith-Raymond Co., Columbus, Ga.

DUST COLLECTORS See Collectors, Dust

EAVES TROUGH FITTINGS AND ACCESSORIES See Fittings and Accessories, Eaves Trough and Gutter

EAVES TROUGH AND GUTTERS

EAVES TROUGH AND GUTTERS

American Rolling Mill Co., Middletown, O. (Stainless) American Sheet Metal Works, New Orleans. Ames Co., W. R., San Francisco.
Anderson Mfg. Co., Des Moines, Ia.
Barnes Metal Products Co., Chicago.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.

Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O. Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Bridesburg Foundry Co., Philadelphia.
Chase Brass & Copper Co., Inc., Waterbury, Conn. Chicago Metal Mfg. Co., Chicago.
Cinciannati Sheet Metal & Roofing Co., Cincianati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincianati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.

Hussey & Co., C. G., Pittsburgh.
Klauber Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchle Co., Cambridge, Mass.
Ledkote Products Co., Long Island City, N. Y.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
Milcor Steel Co., Milwaukee. (Square Hanging)
Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Northern Furnace & Supply Co., Billings, Mont.

Osborn Co., J. M. & L. A., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
Ryniker Steel Products Co., Billings, Mont.
Scheet Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Index to Advertisers, page 314.

• Advertisement in this issue. See Index to Advertisers, page 314.

Southern States Iron Roofing Co., Savannah, Ga. Southern States Iron Roofing Co., Savannah, G Standard Furnace & Supply Co., Omaha, Nebr. Tiffin Eaves Trough Clamp Co., Tiffin, O. Van Noorden Co., E., Boston. Wheeling Corrugating Co., Wheeling, W. Va. Williams-Wallace Co., San Francisco. Woolwine Metal Products Co., Los Angeles. York Corrugating Co., York, Pa.

ELBOW MACHINES

See Machines, Elbow

ELBOWS, BLOW PIPE

See Fittings, Blow Pipe

ELBOWS, CONDUCTOR

See Fittings and Accessories, Conductor

ELBOWS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

ELECTRIC WELDERS

See Welders, Arc, Spot

ELECTRODES, ARC WELDING

Air Reduction Sales Co., New York City.
Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Allied Weld-Craft, Inc., Indianapolis.
Aluminum Co. of America, Pittsburgh.
American Agile Corporation, Cleveland,
American Brass Co., Waterbury, Conn. American Agile Corporation, Cleveland.
American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Aroos Corporation, Philadelphia.
Atlantic Steel Co., Atlanta, Ga.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Ergolyte Manufacturing Co., Philadelphia.
Electric Arc, Inc., Newark, N. J.
Eutectic Welding Alloys Co., New York City.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee.
Hobart Brothers Co., Troy, O.
Hollup Corp. Div., National Cylinder Gas Co., Chicago.
Laclede Steel Co., St. Louis.
Lincoln Electric Co., Cleveland.
Marquette Mfg. Co., Inc., Minneapolis.
Maurath, Inc., Cleveland.
McKay Co., York, Pa.
Metal & Thermit Corp., New York City.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div. of American Chain & Cable Co., Inc.,
Monessen, Pa.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland. Universal Power Corporation, Cleveland.
 Victor Equipment Co., San Francisco. Welding Apparatus Co., Chicago. Westinghouse Electric & Mfg. Co., East Pittsburgh. Wilson Welder & Metals Co., Inc., New York City.

ENAMELS & LACQUERS

Acme White Lead & Color Works, Detroit. Acorn Refining Co., Cleveland.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Debevoise Co., Brooklyn. (Enamels) Detroits Co., Brooklyn. (Enamels)
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
Dragert Co., C. H., Inc., Brooklyn.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Ferro Enamel Corporation, Cleveland. Ferro Enamel Corporation, Cleveland.
Glidden Co., The, Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ili.
Krehbiel Co., J. H., Chicago.
Maas & Waldstein Co., Newark, N. J.
O'Brien Varnish Co., South Bend, Ind.
Pittsburgh Plate Glass Co., Pittsburgh.
Quigley Co., Inc., New York City.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland. (Enamel)
U. S. Gutta Percha Paint Co., Providence, R. I.
Walles Dove-Hermiston Corp., Westfield, N. J. Wattenamel Co., Summit, Ill. Wilhelm Co., A., Reading, Pa. Zapon Div., Atlas Powder Co., North Chicago, Ill.

EXHAUSTERS, WELDING FUME

Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Irvington, N. J.

Chicago Pneumatic Tool Co., New York City. Coppus Engineering Corp., Worcester, Mass. Copus Engineering Corp., Worcester, Mass.
Day Co., Minneapolis.
Dynamic Air Engineering, Inc., Los Angeles.
Klee Co., George B., Cincinnati.
Ruemelin Mfg. Co., Milwaukee.
Sawyer Electrical Mfg. Co., Los Angeles.
Sturtevant Co., B. F., Hyde Park, Boston.
Torit Manufacturing Co., St. Paul, Minn.
Utility Fan Corporation, Los Angeles.
Whiting Corporation, Los Angeles.
Whiting Corporation Hayvey III

Whiting Corporation, Harvey, Ill.

EXPANSION BOLTS

See Bolts, Expansion

FACES, COLD AIR, WOOD

Antigo Bldg. Supply Co., Antigo, Wis.

• Auer Register Co., Cleveland.

Eaglesfield Ventilator Co., Indianapolis. Garber Lumber & Construction Co., Strasburgh, O. Lockjoint Wood Products Co., Wichita, Kans. Marsh Lumber Co., Inc., Dover, O.

United States Register Co., Battle Creek, Mich.
Wooster Art Wood, Inc., Wooster, O.

FAN-FILTER UNITS, PROPELLER

(Separate conversion unit for warm air furnaces)

Air Controls, Inc., Cleveland, Lau Blower Co., Dayton, O. Mellish & Murray Co., Chicago. Peerless Electric Co., Warren, O.

Utility Fan Corporation, Los Angeles. Wayne Automatic Relay Co., Fort Wayne, Ind.

FAN HOUSINGS

See Housings, Fan

FANS, BOOSTER, COLD AIR RETURN

A-C Mfg. Co., Pontiac, Ill.

Advance Aluminum Castings Corp., Chicago.

Air Conditioning Products Co., Detroit.

Aire-Foile Fan & Blower Co., Detroit.

Bern's Specialty Mfg. Co., Chicago.

Brumme Mfg. Co., Bloomington, Ill.

Cary Mfg. Co., Waupaca, Wis.

Chelsea Fan & Blower Co., Inc., Irvington, N. J.

Economy Electric Mfg. Co., Cicero, Ill.

General Blower Co., Inc., Philadelphia.

International Engineering, Inc., Dayton, O.

La-Del Conveyor & Mfg. Co., New Philadelphia, O.

Mauer Engineering, Evanston, Ill.

Midwestern Supply Co., Bloomington, Ill.

Peerless Electric Co., Warren, O.

Propellair, Inc., Springfield, O. Propellair, Inc., Springfield, O.
Roan Mfg. Co., Racine, Wis.
Semco Mfg. Co., Nashville, Tenn.
Universal Blower Co., Birmingham, Mich.

· Utility Fan Corporation, Los Angeles.

FANS, BOOSTER, ONE-PIPE WARM AIR

Advance Aluminum Castings Corp., Chicago.
Air Conditioning Products Co., Detroit.
Aire-Folle Fan & Blower Co., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
Brumme Mfg. Co., Bloomington, Ill.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Dual-Air Fan Corporation, Chicago.
Economy Electric Mfg. Co., Cicero, Ill.
Mauer Engineering, Evanston, Ill.
Midwestern Supply Co., Chicago.

Mueller Furnace Co., L. J., Milwaukee.
Universal Blower Co., Birmingham, Mich.
Victor Electric Products, Inc. Cincinnati

Victor Electric Products, Inc., Cincinnati.

FANS, FURNACE, PROPELLER TYPE

(Complete with mounting for installation in cold air return)

Air Controls, Inc., Cleveland.

Air Controls, Inc., Cleveland.
Belanger Fan & Blower Co., Detroit.
Brumme Mfg. Co., Bloomington, Ill.
Century Fan & Ventilator Co., New York City.
Dual-Air Fan Corporation, Chicago.
General Aire Co., Philadelphia.

Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Johnston Co., Wm. W., Dayton, O.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Meier Electric & Machine Co., Indianapolis.
Midwestern Supply Co., Bloomington, Ill. Midwestern Supply Co., Bloomington, Ill. Peerless Electric Co., Warren, O. Propellair, Inc., Springfield, O.
Semco Mfg. Co., Nashville, Tenn.
Trade-Wind Motor Fans, Inc., Los Angeles.

• Utility Fan Corporation, Los Angeles.

Advertisement in this issue. See Index to Advertisers, page 314.

FANS, KITCHEN EXHAUST

FANS, KITCHEN EXHAUST

Aire-Folle Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
Air-O-Line Co., Dallas, Tex.

• Allen Corp., Detroit, Mich.
American Blower Corp., Detroit.
American Coolair Corp., Jacksonville, Fla.
Arex Co., Chicago.
Barrett Engineers, Cleveland Heights, O.
Belanger Fan & Blower Co., Detroit.
Bern's Specialty Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Chicago.
Bishop & Babcock Mfg. Co., Lancaster, Pa.

• Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.

• Clarage Fan Co., Kalamazoo, Mich.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Dynamic Air Engineering, Inc., Los Angeles.
Economy Electric Mfg. Co., Ciecro, Ill.
Electrovent Corp., Detroit.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Garden City Fan Co., Chicago.
General Aire Co., Philadelphia.
Hirschman Co., Inc., W. F., Buffalo.
Hunter Fan & Ventilating Co., Menghis, Tenn.

• Ing Electric Ventilating Co., Ohicago.
International Engineering, Inc., Dayton, O.
King Ventilating Co., Owantonna, Minn.
Lohman, Inc., Wm. J., Irvington, N. J.
Marathon Electric Mfg. Co., Oticago.
International Engineering, Inc., Dayton, O.
King Ventilating Co., Owantonna, Minn.
Lohman, Inc., Wm. J., Irvington, N. J.
Marathon Electric Co., Pittsburgh.

• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Peerless Electric Co., Pittsburgh.

• Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.
Roan Mfg. Co., Nashville, Tenn.

• Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe and Heater Co., Inc., St. Louis.
Smith Manufacturing Company, Chicago.

Semco Mfg. Co., Nashville, Tenn.

• Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe and Heater Co., Inc., St. Louis.
Smith Manufacturing Company, Inc., F. A., Rochester, N. Y.

• Sturtevant Co., B. F., Hyde Park, Boston.
Universal Blower Co., Einmingham, Mich.

• U. S.

FANS, NIGHT AIR COOLING, COMPLETE UNIT

Air Controls, Inc., Cleveland.
Aire-Foile Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
Air-O-Line Co., Dallas, Tex.

Aire-Folle Fan & Blower Co., Detroit.
Airmaster Corp., Chicago.
Air-O-Line Co., Dallas, Tex.
Alco Manufacturing Co., Houston, Tex.

Alco Manufacturing Co., Houston, Tex.

Allen Corporation, Detroit.
American Blower Corp., Jacksonville, Fla.
Associated Southern Industries, Memphis, Tenn.
Barrett Engineers, Cleveland Heights, O.
Belanger Fan & Blower Co., Detroit.
Belco Exhaust Fan Mfg. Co., St. Louis.
Bern's Specialty Mfg. Co., Chicago.
Bryant Heater Co., Cleveland.
Buffalo Forge Co., Buffalo.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.

• Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Circulators & Devices Mfg. Corp., New York City.
Dallas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Earl Company, Warren, Houston, Tex.
Economy Electric Mfg. Co., Cicero, Ill.
Electrovent Fan & Mfg. Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Co., Chicago.
General Aire Company, Philadelphia.
General Blower Co., Inc., Philadelphia.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman Co., Inc., W. F., Buffalo.
Hunter Fan & Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Jaden Manufacturing Co., F., Hastings, Nebr.
Jamieson Mfg. Co., Dallas, Tex.
Johnson Fan & Blower Corp., Chicago.
Jordan & Co., Paul R., Indianapolis.
Kelley Mfg. Co., Houston, Tex.
King Ventilating Co., Owatonna, Minn.

◆ Lau Blower Co., Dayton, O. Lohman, Inc., William J., Irvington, N. J. Marathon Electric Mfg. Corp., Wausau, Wis. Meier Electric & Machine Co., Indianapolis. Murray Co., Dallas, Tex.

Murray Co., Dalias, Tex.

Nelson Corporation, Herman, Moline, Ill.
New York Blower Co., Chicago.

Palmer Manufacturing Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.

Peerless Electric Co., Warren, O.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Co., Chicago.
Roto-Beam Div., Peerless of America, Chicago.
Schwitzer-Cummins Co., Indianapolis.
Shreveport Engineering Co., Inc., Shreveport, La.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis
Blow Pipe & Heater Co., Inc., St. Louis.
South Bend Air Products, Inc., South Bend, Ind.
Sturtevant Co., B. F., Hyde Park, Boston.
Universal Blower Co., Birmingham, Mich.
U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
U. S. Machine Corporation, Lebanon, Ind.
Victor Electric Products, Inc., Cincinnati.

Victor Electric Products, Inc., Cincinnati,
Viking Air Conditioning Corp., Cleveland.
Vulcan Metal Products Co., Birmingham, Ala.
Ward Co., Edgar T., River Forest, Ill.
Western Blower Co., Seattle, Wash.
Wind-Way Fan & Ventilating Co., Inc., New Orleans. Wood Industries, Inc., Gar, Detroit.

FANS, VENTILATING, PROPELLER TYPE

(Capacity 4,000 c.f.m. up)

Aerovent Fan Co., Piqua, O. Air Controls Inc., Cleveland. Aire-Folle Fan & Blower Co., Detroit. Airmaster Corp., Chicago. Air-O-Line Co., Dallas, Tex.

Aire-Foile Fan & Blower Co., Detroit.

Airmaster Corp., Chicago.

Air-O-Line Co., Dallas, Tex.

Alco Manufacturing Co., Houston, Tex.

Allen Corp., Detroit.

American Blower Corp., Detroit.

American Coolair Corp., Jacksonville, Fla.

Arex Co., Chicago.

Bahnson Co., Winston-Salem, N. C.

Barrett Engineers, Cleveland Heights, O.

Bayley Blower Co., Milwaukee.

Belanger Fan & Blower Co., Detroit.

Belco Exhaust Fan Mfg. Co., St. Louis.

Bern's Specialty Mfg. Co., Chicago.

Bishop & Babcock Mfg. Co., Chicago.

Bishop & Babcock Mfg. Co., Chicago.

Bishop & Babcock Mfg. Co., Lancaster, Pa.

Campbell Heating Company, E. K., Kansas City, Mo.

Century Fan & Ventilator Co., New York City.

Champion Blower & Forge Co., Lancaster, Pa.

Chelsea Fan & Blower Co., Inc., Irvington, N. J.

Circulators & Devices Mfg. Corp., New York City.

Clarage Fan Co., Kalamazoo, Mich.

Coppus Engineering Corporation, Worcester, Mass.

Dallas Eng Co., Inc., Dallas, Tex.

De Bothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.

Diehl Mfg. Co., Somerville, N. J.

Dual-Air Fan Corporation, Chicago.

Duriron Co., Inc., Dayton, O. (Acid Resisting).

Dynamic Air Engineering, Inc., Los Angeles.

Earl Company, Warren, Houston, Tex.

Eclipse Air Brush Co., Inc., Newark, N. J.

Economy Electric Mfg. Co., Chicago.

Emerson Electric Mfg. Co., Chicago.

General Blower Co., Chicago.

General Blower Co., Chicago.

General Blower Co., Chicago.

General Blower Co., Chicago.

General Electric Company, Philadelphia.

General Blower Co., Chicago.

General Electric Co., Bloomfied, N. J.

Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids.

Michigan.

Guth Company, Edwin F., St. Louis.

Hartzell Propeller Fan Co., Pigua. O.

Michigan.
Guth Company, Edwin F., St. Louis.
Hartzell Propeller Fan Co., Piqua, O.
Hirschman Co., Inc., W. F., Buffalo.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
International Engineering, Inc., Dayton, O.
Johnston & Co., Wm. W., Dayton, O.
Johnston & Co., Wm. W., Dayton, O.
Jordan & Co., Paul R., Indianapolis.
Kelley Manufacturing Co., Houston, Texas.
King Ventilating Co., Owatonna, Minn.
Klee Co., George B., Cincinnati.
La-Del Conveyor & Mfg. Co., New Philadelphia, O.
Lau Blower Co., Dayton, O.
Lohman, Inc., Wm. J., Irvington, N. J.
Marathon Electric Mfg. Corp., Wausau, Wis.
McCord Radiator & Mfg. Co., Detroit.
Meier Electric & Machine Co., Indianapolis.
Mountain States Equipment Co., Denver, Colo.
Index to Advertisers, page 314.

• Advertisement in this issue. See Index to Advertisers, page 314.

ry, 1944

Myers Electric Co., Pittsburgh.

Myers Electric Co., Pittsburgh.

Nelson Corporation, Herman, Moline. Ill.
New York Blower Co., Chicago.

Palmer Manufacturing Corp, Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Perkins & Son., Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.

Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Company, Chicago.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Schwitzer-Cummins Co., Indianapolis.
Semco Mfg. Co., Nashville, Tenn.
Shreveport Engineering Co., Inc., Shreveport, La.
Signal Electric Mfg. Co., Menominee, Mich.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis
Blow Pipe & Heater Co., Inc., St. Louis.
South Bend Air Products, Inc., South Bend, Ind.
Spartan Electric Company, Rochester, N. Y.
Steamaire Co., Cincinnati.

Spartan Electric Company, Rochester, N. Y. Steamaire Co., Cincinnati.

Sturtevant Co., B. F., Hyde Park, Boston. Trane Company, La Crosse, Wis. Trufio Fan Co., Harmony, Pa.

U. S. Air Conditioning Corp., Minneapolis. U. S. Machine Corporation, Lebanon, Ind.

Utility Fan Corporation, Los Angeles.

Viking Air Conditioning Corp., Cleveland. Ward Co., Inc., Edgar T., River Forest, Ill. Ward Mfg. Co., Plymouth, Mich. Water Cooling Equipment Corp., St. Louis. Western Blower Co., Seattle, Wash. Western Engineering & Mfg. Co., Los Angeles. Wind-Way Fan & Ventilating Co., Inc., New O Wind-Way Fan & Ventilating Co., Inc., New Orleans. Wing Mfg. Co., L. J., New York City.

FANS, WINDOW VENTILATING

Air Conditioning Products Co., Detroit. Air Conditioning Products Co., Detroit.
Air Controls, Inc., Cleveland.
Airgard Manufacturing Co., Chicago.
Air-O-Line Co., Dallas, Texas.
Alco Manufacturing Co., Houston, Tex.
American Blower Corporation, Detroit.
American Metal Products Co., Fort Worth, Tex.
Bern's Specialty Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Clarage Fan Co., Kalamazoo, Mich.
Daflas Engineering Co., Inc., Dallas, Tex.
Diehl Mfg. Company, Elizabethport, N. J.
Dual-Air Fan Corporation, Chicago.
Earl Company, Warren, Houston, Tex.
Electrovent Fan & Manufacturing Co., Chicago.
Emerson Electric Mfg. Co., St. Louis.
Fresh'nd-Aire Company, Philadelphia.
General Aire Company, Philadelphia.
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago.
Lau Blower Co., Dayton, O.
Lohman, Inc., Wm. J., Irvington, N. J.
Meier Electric and Machine Co., Indianapolis.
National Engineering & Manufacturing Co., Kansas City.
Nelson Corporation, Herman, Moline, Ill.
Peerless Electric Co., Warren, Ohio.
Reed Unit-Fans, Inc., New Orleans, La.
Roto-Beam Div., Peerless of America, Inc., Chicago.
Schwitzer-Cummins Co., Indianapolis.
Semco Mfg. Co. Nashville, Tenn.
Shreveport Engineering Co., Inc., Shreveport, La.
Sturtevant Co., B. F., Hyde Park, Boston.
Utility Fan Corporation, Los Angeles.
Victor Electric Products, Inc., Cincinnati.
Viking Air Conditioning Corporation, Cleveland.
Ward Co., Inc., Edgar T., River Forest, Ill.
Ward Mfg. Co., Plymouth, Mich.
Wind-Way Fan & Ventilator Co., Inc., New Orleans. Air Controls, Inc., Cleveland. Airgard Manufacturing Co., Chicago.

FASTENINGS, SPRING STEEL

Shakeproof, Inc., Chicago. Tinnerman Products, Inc., Cleveland.

FILTERS, AIR, AUTOMATIC

Air Stream Filter Corp., St. Louis.

Air Stream Filter Corp., St. Louis.
Air & Refrigeration Corp., New York City.
American Air Filter Co., Inc., Louisville, Ky.
Brauer Supply Co., A. G., St. Louis.
Dollinger Corporation, Rochester, N. Y.
Dracco Corporation, Cleveland.
Farr Company, Los Angeles.
Prat-Danial Corporation, Port Chester, N. Y.
Westinghouse Electric & Mfg. Co., Cleveland (Electrostatic Precipitator).

FILTERS, AIR, UNIT, CLEANABLE

Air Devices, Inc., New York City. Air Filter Engineering Co., Chicago (Galvanized Wire Cloth).

Air Maze Corp., Cleveland (Metal-Wire Baffles).

Air Maze Corp., Ceveland (Metal-Wife Ballies).
Air Stream Filter Corp., St. Louis.

• American Air Filter Co., Inc., Louisville, Ky. (Steel wool).
Amirton Co., Inc., 27 Pearl St., New York City.
Badger Mfg. & Sales Co., Milwaukee (Steel Wool).

• Brauer Supply Co., A. G., St. Louis.
Chicago Filter Co., Joliet, Ill.
Compus Engineering Corp. Worgester, Mass. (Felt).

Coppus Engineering Corp., Worcester, Mass. (Felt).
Davies Air Filter Corp., New York City.
Detroit Lubricator Co., Detroit (Fiber).
Dollinger Corporation, Rochester, N. Y. (Feltex, Glastex, heat

resistant cotton).

resistant cotton).
Farr Company, Los Angeles (Metal Screen).
Filters, Incorporated, Glendale, Calif. (Felt).
Hugo Mfg. Co., West Duluth, Minn.
Kauffman Air Conditioning Corp., St. Louis.
Kleenaire Corp., Stevens Point, Wis.
Research Products Corporation, Madison, Wis. (Metal).
Somers, Inc., H. J., Detroit (Hair Glass).
Supreme Air Filter Co., New York City.
Tuttle Air Filter Co., Inc., Louisville, Ky. (Split wire fiber).
Universal Air Filter Corp., Duluth, Minn. (Cellulose).

FILTERS, AIR, UNIT, THROWAWAY

 American Air Filter Co., Inc., Louisville, Ky.
 Amirton Co., Inc., 27 Pearl St., New York City.
 Arcweld Manufacturing Co., Inc., Seattle, Wash.
 Badger Mfg. & Sales Company, Milwaukee (Paper).
 Blocksom & Company, Michigan City, Ind. (Flame proof curled fibre and hair).

Chicago Filter Co., Joliet, Ill.

Davies Air Filter Corp., New York City.

Detroit Lubricator Co., Detroit (Fibre).

Dollinger Corporation, Rochester, N. Y. (Feltex, Glastex and heat resistant cotton).

heat resistant cotton).

Gehri Company, Tacoma, Wash. (Viscous).

Kleenaire Corp., Stevens Point, Wis.

Owens-Corning Fiberglas Corp., Toledo, O. (Fiberglas).

Research Products Corp., Madison, Wis. (Expanded flame-proofed kraft fibre).

Universal Air Filter Corp., Duluth, Minn. (Cellulose).

Wilson & Co., Inc., Chicago.

Zim Filter Co., Hammond, Ind.

Zimmerman, R. F., Cincinnati (Gravity Cold Air).

FIRE BRICK

See Refractories

FIREPOTS

See Repairs, Stove and Furnace

FIRING TOOLS

See Tools, Firing

FITTINGS AND ACCESSORIES, CONDUCTOR (Elbows, Heads, Hooks, Shoes, Straps, etc.)

Allred Manufacturing Co., Inc., Indianapolis.
Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Boyd & Co., Inc., Charles P., Philadelphia.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Crary Mfg. Co., Middleport, O. (Cut-off).
Dieckmann Co., Ferdinand, Cincinnat.
Downs-Smith Brass & Copper Co., New York City.

Allred Manufacturing Co., Inc., Indianapolis.

Dieckmann Co., Ferdinand, Cincinnati.

Downs-Smith Brass & Copper Co., New York City.

Edwards Mfg. Co., Inc., Cincinnati.

Globe Iron Roofing & Corrugating Co., Newport, Ky.

Gray Metal Products, Inc., Rochester, N. Y.

Hussey & Co., C. G., Pittsburgh.

Iwan Bros., South Bend, Ind.

Klauer Mfg. Co., Dubuque, Ia.

La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.

Lamb & Ritchie Co., Cambridge, Mass La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis. Lamb & Ritchie Co., Cambridge, Mass.
Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Mayville, Wis.
Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Osborn Co., J. M. & L. A., Cleveland.
Rival Strap Corp., New York City (Ornamental Conductor Straps).

Straps).

Straps).
Royal-Apex Mfg. Corp., Brooklyn.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Stewart Foundry, O. S., Cleveland (Iron Conductor Shoes).
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
United States Register Co., Battle Creek, Mich.
Wheeling Corrugating Co., Wheeling, W. Va.
Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.

Advertisement in this issue, See Index to Advertisers, page 314.

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FITTINGS AND ACCESSORIES, EAVES TROUGH AND

(Hangers, Strainers, Miters, Ends, Thimbles, etc.)

(Hangers, Strainers, Miters, Ends, Thimbles, etc.)
Abbott Mfg. Co., Painesville, O. (Hangers).
Ames Co., W. R., San Francisco.
Audubon Wire Cloth Corp., Philadelphia (Strainers).
Barnes Metal Products Co., Chicago.

Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Bertram Mfg. Co., Chicago.
Boyd & Co., Inc., Charles P., Philadelphia.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co.. Cincinnati.
Downs-Smith Brass & Copper Co.. New York City.
Eav-Tex Company, Upper Darby, Pa. (Roof Gutter Protection).
Edwards Mfg. Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co.. Newport, Ky.
Grand Rapids Wire Products Co., Grand Rapids, Mich.
Gray Metal Products, Inc., Rochester, N. Y.
Herbert & Sons, T. L., Nashville, Tenn.

Hussey & Co., C. G.. Pittsburgh (Copper).
Iwan Brothers, South Bend, Ind.
Juniper Elbow Company, Inc., Middle Village, L. I., N. Y.
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Ledkote Products Co., Long Island City, N. Y.

La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Ledkote Products Co., Long Island City, N. Y.
Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore.
Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, Ohio.
New Way Products Company, Toledo (Eaves Trough Shield).
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Ohio Wire Products Co., Dover, O. (Hangers).
Osborn Co., J. M. & L. A., Cleveland.
Reeves Steel & Mfg. Co., Dover, O.
Royal-Apex Mfg. Corp., Brooklyn.
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peoria, Ill.
Snap-On Mfg. Co., Chicago (Hangers).
Southern States Iron Roofing Co., Savannah, Ga. Snap-On Mrg. Co., chicago (Tangers).
Southern States Iron Roofing Co., Savannah, Ga.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
U. S. Cistern Filter Mfg. Co., Bloomington, Ill.
Wade Manufacturing Co., Elgin, Ill. (Roof Drains).
Wheeling Corrugating Co., Wheeling, W. Va.
Williams-Wallace Co., San Francisco. Woolwine Metal Products Co., Los Angeles.

FITTINGS AND ACCESSORIES, FURNACE PIPE

(Angles, Boots, Elbows, Heads, Joints, Offsets, Tees etc.)

Acer & Whedon, Inc., Madina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Adelta Manufacturing Co., Philadelphia.
Arcweld Manufacturing Co., Inc., Seattle, Wash. Acme Tin Plate & Roofing Supply Co., Philadelphia.
Adelta Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Company, Columbus, Ohio.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Bergstrom Mfg. Corp., Neenah, Wis.
Braden Mfg. Co., Terra Haute, Ind.
Campbell Heating Co., Des Moines, Ia.
Cary Mfg. Co., Waupaca, Wis.
Champion Furnace Pipe Co., Peoria, Ill.
Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Stamping Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steel Furnace Co., Chicago.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farquhar Furnace Co., Wilmington, O.
Fraser & Johnston Co., San Francisco.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines, Ia.

Henry Furnace Company, Medina, Ohio.
Herbert & Sons, T. L., Nashville, Tenn.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Howe & Bassett Co., Inc., Rochester, N. Y. (Boots).
Howes-Woods Company, Cambridge, Mass.
International Heater Co., Utica, N. Y.
Juniper Elbow Company, Des Moines, Iowa.

La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
(Elbows and pipe only).
Lamneck Products, Inc., Middletown, Ohio.
Lennox Furnace Co., Marshalltown, Ia.
Lyman Co., H. B., Southampton, Mass.
Lyon, Conklin & Co., Inc., Baltimore.

Majestic Co., Huntington, Ind.
Maple City Furnace Co., Marshall, Mich.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee.
Monarch Furnace Fittings Manufacturers, Chicago.

Montag Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee.
Osborn Co., J. M. & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Company, Dowagiac, Mich.
Reeves Steel & Mfg. Co., Dover, O.
Rock Island Register Co., Rock Island, Ill.
Ryniker Steel Products Co., Billings, Mont.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Specialty Co., Pittsburgh.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
Tri-State Heating Supply Company, Fort Wayne, Ind.
United States Register Co., Battle Creek, Mich.
Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.

FITTINGS AND ACCESSORIES, SMOKE PIPE (Draw-bands, Clean-outs, Collars, Tees, etc.)

FITTINGS AND ACCESSORIES, SMOKE PIPE
(Draw-bands, Clean-outs, Collars, Tees, etc.)

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.

Arcweld Manufacturing Co., Inc., Seattle, Wash.

Armstrong Furnace Company, Columbus, Ohio.

Atlas Heating & Ventilating Co., Ltd., San Francisco.

Bardes Range & Foundry Co., E. H., Cincinnati.

Bergstrom Mfg. Corp., Neenah, Wis.

Bieler & Son, L., Long Island City, N. Y.

Braden Mfg. Co., Terre Haute, Ind.

Brauer Supply Co., A. G., St. Louis.

Cary Mfg. Co., Waupaca, Wis.

Champion Furnace Pipe Co., Peoria, Ill.

Char-Gale Mfg. Co., Minneapolis.

Chicago Metal Mfg. Co., Chicago.

Cincinnati Stamping Co., Cincinnati.

Corbman Bros., Inc., Philadelphia.

Detroit Safety Furnace Pipe Co., Detroit.

Excelsior Steel Furnace Co., Chicago.

Excelsior Steel Furnace Co., Chicago.

Excelsior Stove & Mfg. Co., Quincy, Ill.

Green Colonial Furnace Co., Des Moines, Ia.

Henry Furnace Company, Medina, Ohio.

Herbert & Sons, T. L., Nashville, Tenn.

Homer Furnace & Foundry Corporation, Coldwater, Mich.

Howes-Woods Company, Cambridge, Mass.

International Heater Co., Utica, N. Y.

Juniper Elbow Company, Inc., Middle Village, L. I., N. Y.

Keith Furnace Company, Des Moines, Ia.

La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.

Lamneck Products, Inc., Columbus, Ohio.

Lennox Furnace Co., Marshalltown, Ia.

Lyman Co., H. B., Southampton, Mass.

Lyon, Conklin & Co., Inc., Baltimore.

Majestic Co., Huntington, Ind.

Maple City Furnace Co., Marshall, Mich.

May-Fleberger Company, Newark, Ohio.

Meyer & Bro. Co., F., Peoria, Ill.

Wilcor Steel Co., Milwaukee, Wis

Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
May-Fleberger Company, Newark, Ohio.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Wis.
Montag Stove & Furnace Works, Portland, Ore.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Osborn Co., J. M. & L. A., Cleveland.
Patten Co., J. V., Sycamore, Ill.
Peacard Co., M. A., Boston.
Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Company, Dowagiac, Mich.
Reeves Steel & Mfg. Co., Dover, O.
Rock Island Register Co., Rock Island, Ill.
Scheeter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Skinner Heating & Ventilating Co., Heater Div. of St. Louis.
Blow Pipe & Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
Tierney Rotor Ventilator Co., Minneapolis.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.
Trl-State Heating Supply Company, Fort Wayne, Ind.
United States Register Co., Battle Creek, Mich.
Waterman-Waterbury Co., Minneapolis.
Waverly Heating Supply Co., Boston.
Wheeling Corrugating Co., Wheeling, W. Va.
Wilder Manufacturing Co., Niles, O.
Williamson Heater Co., Cincinati.

Williamson Heater Co., Cincinnati

FITTINGS, BLOW PIPE

(Elbows, Flanges, Hangers, Hoods and Sweeps, Joints, Rings, Tubing) Allington & Curtis Mfg. Co., Saginaw, Mich. Chicago Metal Mfg. Co., Chicago. Cincinnati Sheet Metal & Roofing Co., Cincinnati.

• Advertisement in this issue. See Index to Advertisers, page 314.

Day Co., Minneapolis.
Falstrom Co., Passaic, N. J.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich Mich.
Kirk & Blum Mfg. Co., Cincinnati (Adjustable Buffing Hoods).
Mahon Co., R. C., Detroit.
Peters-Dalton, Inc., Detroit.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Schmieg Industries, Detroit.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Tiffin Eaves Trough Clamp Co., Tiffin, Ohio.

• United States Register Co., Battle Creek, Mich.
Western Blower Co., Seattle, Wash.

Western Blower Co., Seattle, Wash. Winkler & Sons, Inc., A. E., Milwaukee. Young & Bertke Co., Cincinnati.

FITTINGS, COPPER TUBE, COMPRESSION

Packless Metal Products Corporation, New Rochelle, N. Y. (self-

FITTINGS, HUMIDIFIER, WATER LINE

American Brass Co., Waterbury, Conn. American Brass Co., Waterbury, Conn.
Hays Mfg. Co., Erie, Pa.

McDonnell & Miller, Chicago.
Maid-O'-Mist, Inc., Chicago.
Monmouth Products Co., Cleveland.
Parker Appliance Co., Cleveland.
Reichert Float & Mfg. Co., Toledo, O.
Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
Skuttle Manufacturing Co., Detroit.
Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron,
Mich. Weatherhead Co., Cleveland.

> **FLANGERS** See Machines, Flanging

FLANGES, BLOW PIPE

See Fittings, Blow Pipe

FLASHINGS, ROOF, PATENTED Alpha Metal & Rolling Mills, Inc., Brooklyn.

American Rolling Mill Co., Middletown, Ohio (Galvanized).
Barrett Division, Allied Chemical & Die Corporation, New York City (for brick and concrete).
Berger Mfg. Div. Republic Steel Co., Canton, Ohio.
Biersach & Niedermeyer Co., Milwaukee.
Byers Flashing Sales Division, Chicago.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Chicago Metal Products Co., Trenton, N. J.
Chicago Metal Mfg. Co. Chicago.

Cheney Metal Products Co., Trenton, N. J.
 Chicago Metal Mfg. Co., Chicago.
 Copper Roofs Corporation, Milwaukee.
 Cox Roofing Co., Winston-Salem, N. C.
 Downs-Smith Brass & Copper Co., New York City.
 Eagle-Picher Lead Co., Cincinnati.
 Edwards Mfg. Co., Inc., Cincinnati.
 Figge Mfg. Co., Chicago.
 Flemm Lead Company, Inc., Long Island City, N. Y.
 Hussey & Co., C. G., Pittsburgh.
 Majestic Flashing Company, Raltimore

Hussey & Co., C. G., Pittsburgh.
Majestic Flashing Company, Baltimore.
Milcor Steel Co., Milwaukee.
National Lead Company, New York City.
New Delphos Manufacturing Co., Delphos, Ohio.
Robertson Co., H. H., Pittsburgh.
Rochester Lead Works, Inc., Rochester, N. Y.
Schoedinger, F. O., Columbus, O.
Simplex Manufacturing Co., Fond du Lac, Wis.
Van Noorden Co., E., Boston.
Williams-Wallace Co., San Francisco.
York Corrugating Co., York, Pa.

FLASHINGS, THROUGH-WALL, PATENTED

Alpha Metal & Rolling Mills, Inc., Brooklyn.

American Brass Co., Waterbury, Conn. (Copper).

Biersach & Niedermeyer Company, Milwaukee.

Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Cheney Metal Products Co., Trenton, N. J.

Downs-Smith Brass & Copper Co., Inc., New York City. Figge Mfg. Co., Chicago.

Majestic Flashing Company, Baltimore.

New Delphos Manufacturing Co., Delphos, Ohio.
Robertson Co., H. H., Pittsburgh.

ThruBond Flashing Corp., New York City.

Van Noorden Co., E., Boston.

FLASHINGS, WALL, PATENTED

Alpha Metal & Rolling Mills, Inc., Brooklyn. Alpha Metal & Rolling Mills, Inc., Brooklyn.

Biersach & Niedermeyer Company, Milwaukee.

Cheney Metal Products Co., Trenton, N. J.

Copper Roofs Corporation, Milwaukee.

Figge Mfg. Co., Chicago.

La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis. Majestic Flashing Company, Baltimore Milcor Steel Co., Milwaukee. New Delphos Manufacturing Co., Delphos, Ohio.

Schoedinger, F. O., Columbus, O. ThruBond Flashing Corp., New York City. Van Noorden Co., E., Boston. York Corrugating Co., York, Pa.

> **FLOOR FURNACES** See Furnaces, Warm Air, Floor

FLUE GAS ANALYZERS

See Analyzers, CO2, Portable

FLUX, SOLDERING

Air Reduction Sales Company, New York City (Aluminum).

Allen Co., Inc., L. B., Chicago (Aluminum, Copper, Gal. Iron, Stainless Steel).

Stainless Steel).

American Chemical Paint Co., Ambler, Pa.
American Solder & Flux Co., Philadelphia, Pa.
Bastian-Blessing Co., Chicago.
Belmont Smelting & Refining Works, Inc., Brooklyn.

Benson Co., Inc., Alex R., Hudson, N. Y. (Salts, Pastes for Copper, Galvanized, Stainless).

Burnley Battery & Mfg. Co., North East, Pa. (Paste, Salts, Solution), (Copper, Galvanized Iron).

Chase Brass & Copper Co., Incorporated, Waterbury, Conn. (Copper sweat fittings).

Colonial Alloys Company, Philadelphia (Stainless).

Colonial Alloys Company, Philadelphia (Stainless).
Diener Mfg. Co., Geo. W., Chicago.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Copper, Galvanized Iron).

Galvanized Iron, Stainless).

Farrelloy Company, Inc., Philadelphia.
Garden City Laboratory, Inc., Chicago.
Gardiner Metal Co., Chicago.
Handy & Harman, New York City (Copper, galvanized iron, stainless).

stainless).

Hercules Chemical Co., Inc., New York City. Johnson Co., Lloyd S., Chicago (Aluminum, stainless steel, copper, galvanized iron).

Johnson Gas Appliance Co., Cedar Rapids, Iowa

Johnson Gas Appliance Co., Cedar Rapids, Jowa.

Kester Solder Co., Chicago (Viscosiformed Paste, Trichloron Salts, Stainless Steel—Paste and Salts).

Langsenkamp Co., F. H., Indianapolis (Stainless Steel).

Lewis Laboratories, Inc., Paul, Milwaukee (Low Tin Content).

Linde Air Products Co., New York City (Aluminum, copper, galv. Iron, stainless).

Lukens Metal Co., Thos. F., Philadelphia (Copper, Galvanized

Iron, Stainless Steel). Motex Metal Process Corporation, Detroit.

Motex Metal Process Corporation, Detroit.
National Cylinder Gas Co., Chicago.
Neilson Chemical Co., Detroit (For Steel).
Pfanstiehl Chemical Co., Waukegan, Ill.
Potomac Mfg. Co., Philadelphia.
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Ruby Chemical Co., Columbus, O. (Liquid and Paste for copper, galv. iron, stainless).

Scalfe Company, Oakmont, Pa.
Torchweld Equipment Div. National Cylinder Gas Co., Chicago
(Aluminum, copper, galv. iron, stainless).
Torco Products, Inc., Los Angeles.
Wolfe-Kote Co., Sheboygan, Wis.
Woodhill, Chomical Co., Claydond.

Woodhill Chemical Co., Cleveland.

FRAMING, FOR HOUSING ASSEMBLIES

Dahlstrom Metallic Door Co., Jamestown, N. Y. Lindsay and Lindsay, Chicago.

FUEL UNITS FOR OIL BURNERS

See Units, Fuel, for Oil Burners

FURNACE BLOWERS See Blowers, Furnace, Centrifugal

FURNACE-BURNER UNITS See Furnaces, Warm Air

FURNACE CEMENT See Cement, Furnace

FURNACE CLEANERS

See Cleaners, Vacuum, Furnace

FURNACE COVERING See Insulation, Furnace and Pipe

> **FURNACE LIGHTERS** See Lighters, Furnace

FURNACE LINING See Refractories

FURNACE PIPE See Pipe, Furnace

FURNACE PIPE FITTINGS AND ACCESSORIES See Fittings and Accessories, Furnace Pipe

• Advertisement in this issue. See Index to Advertisers, page 314.

246

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• Henr Hess-Home Ideal Interr Keith Kelse

MaGir Majes Marsh • May-F Meyer

Monta Mount Muelle Olsen

Pittsb Portla: Premie Reynol

Rock 1 Round • Rudy · Rybolt

St. Lou Schill Schwal Sioux 6

Spear !

AMERICAN

FURNACE REGULATORS

See Regulators, Furnace Draft, Mechanical and Motors, Damper, Furnace Draft, Electrical

FURNACE REPAIRS

See Repairs, Stove and Furnace

FURNACES, CHIMNEY

· Round Oak Co., Dowagiac, Mich.

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FURNACES FOR LARGE BUILDINGS (800,000 Btu and up)

• Airtherm Manufacturing Co., St. Louis.

American Foundry & Furnace Co., Bloomington, Ill.
Chicago Steel Furnace Co., Chicago (Gas or Oil).

• Dravo Corporation, Pittsburgh.
Lennox Furnace Co., Marshalltown, Iowa.

• Mueller Furnace Company, L. J., Milwaukee.
Northwest Stove & Furnace Works, Inc., Portland, Ore.

• Peerless Foundry Co., Inc., Indianapolis.

Stainless & Steel Products So., Saint Paul, Minn.

FURNACES, SOLDERING

Aeroil Burner Co., Inc., West New York, N. J.
Bernz Co., Otto, Rochester, N. Y.
Burgess Soldering Furnace Co., Columbus, O. (Gasoline).
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Floral City Company, Monroe, Mich.
Hones, Inc., Charles A., Baldwin, N. Y.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Liquefied Gas Appliance Co., Mars, Pa.
Peck, Stow & Wilcox Co., Southington, Conn.
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Cedar Rapids, Ia.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago (Gasoline).
Van Praag Sales, New York City.
Vulcan Electric Co., Danvers, Mass.
Wall Mfg. Supply Co., P., N. S. Pittsburgh.
Ward Machinery Co., Chicago (Gas).
Weiss & Co., H., New York City.

FURNACES, WARM AIR, AIR CONDITIONING COAL, CAST IRON (Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Agricola Furnace Co., Inc., Gadsden, Ala.
Airtemp Div. Chrysler Corp., Dayton, Ohio.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andes Range & Furnace Corp., Geneva, N. Y.
Bovee Furnace Works, Waterloo, Ia.
Chandler Co., Cedar Rapids, Ia.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Company, Springfield, Ill.
Faultless Heater Corp., Cleveland.
Forest City Foundries Co., Cleveland.
Front Rank Furnace Company, Div. Liberty Foundry Co.,
St. Louls.

St. Louis.

Frorest City Foundries Co., Cleveland.

Front Rank Furnace Company, Div. Liberty Foundry St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.

Hall-Neal Furnace Co., Indianapolis.
Hart & Crouse Corp., Utica, N. Y.

Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.

International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.

May-Fiebeger Co., Newark, O.
Meyer Furnace Co., L. J., Milwaukee.

Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee.

Olsen Mfg. Co., C. A., Elyria, O.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Co., Springfield, Mo.
Robinson Furnace Co., Chicago.
Rock Island Stove Co., Rock Island, Ill.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Crestline, O.
Schwab Furnace Co., Milwaukee.
Sloux City Foundry & Boiler Company, Sloux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.

Stainless & Steel Products Co., Saint Paul, Minn.
Twentieth Century Heating & Ventilating Co., Akron, O.
Western Furnaces, Inc., Tacoma, Wash.

• Williamson Heater Co., Cincinnati.

• Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.
York Corporation, York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING, COAL, STEEL

(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

(Complete matched, hand-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Airtemp Div., Chrysler Corp., Dayton, Ohio.
American Furnace Co., St. Louis.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., Des Moines, Ia.
Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Deshler Foundry & Machine Works, Deshler, Ohio.
Dowagiac Steel Furnace Company, Dowagiac, Mich.
Excelsior Steel Furnace Co., Chicago.
Farquhar Furnace Co., Wilmington, O.
Fauitiess Heater Corp., Cleveland.
Fitzgibbons Boller Company, Inc., New York City.
Forest City Foundries Co., Cleveland.
Front Rank Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., Indianapolis.
Heatlox Furnaces, Inc., Tacoma, Wash.
Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Hess Warming & Ventilating Co., Chicago.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago.
International Heater Co., Utica, N. Y.
Jackson & Church Co., Saginaw, Mich.
Joilet Heating Corp., Joilet, Ill.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Corp., Joilet, Ill.
Leader Iron Works, Inc., Decatur, Ill.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace Co., Marshalltown, Ia.

McPherson Furnace & Supply Co., Portland, Ore. (Als and wood burning).

• Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.

• May-Flebeger Co., Newark, O.

• Meyer Furnace Co., Peorla, Ill.
Montag Stove & Furnace Works, Portland, Ore.

• Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Portland, Ore.
Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Robinson Furnace Co., Chicago.
Rosebaugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Schill Mfg. Co., Crestline, O.
Schwab Furnace Co., Milwaukee.
Skinner Heating & Vent. Co., Heater Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Smith Heater Co., Peter, Detroit.
Spencer Heater Division, Williamsport, Pa.
Stainless & Steel Products Co., Saint Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Sure Comfort Furnace Co., Berwyn, Ill.
Syncromatic Corporation, Milwaukee.
Viking Manufacturing Corporation, Dayton, Ohio.
Waterman-Waterbury Co., Minneapolis.
Williamson Heater Co., Cincinnati.
Wise Furnace Co., Akron, O.
York Corporation, York, Pa.
FURNACES, WARM AIR, AIR CONDITIONING,

FURNACES, WARM AIR, AIR CONDITIONING, FOR ATTIC INSTALLATION, STEEL

American Furnace Co., St. Louis (Oll or Gas).
Gasconaire, Inc., Detroit (Gas).
Lennox Furnace Co., Marshalltown, Iowa (Gas).

Payne Furnace & Supply Co., Beverly Hills, Calif. (Gas).
York Corporation, York, Pa.

• Advertisement in this issue. See Index to Advertisers, page 314.

FURNACES, WARM AIR, AIR CONDITIONING, GAS, CAST IRON

(Complete matched, gas-fired, furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia Airtemp Division, Chrysler Corporation, Dayton, O. American Foundry & Furnace Co., Bloomington, Ill. American Furnace Company, St. Louis. American Radiator and Standard Sanitary Corp., Pittsburgh. Bastian-Morley Co., Inc., LaPorte, Ind. Beck Engineering Combustion Kompany, St. Louis. Beck Engineering Combustion Kompany, St. Louis.
Bryant Heater Co., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Coroaire Heater Corporation, Cleveland.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.

Forest City Foundrles Co., Cleveland, O.
Green Colonial Furnace Co., Des Moines, Ia.

Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.

International Heater Co., Utica, N. Y.
Moncrief Furnace & Mfg. Co., Dallas, Texas.

Mueller Furnace Co., L. J., Milwaukee.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Olsen Manufacturing Co., C. A., Elyria, Ohio.
Pennsylvania Furnace & Iron Co., Warren, Pa.

Premier Furnace Co., Dowagiac, Mich.

Rudy Furnace Co., Dowagiac, Mich.

Premier Furnace Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
Schwab Furnace Co., Milwaukee.
Security Manufacturing Co., Kansas City, Mo.
Sioux City Foundry and Boiler Company, Sioux City, Ia.
Surface Combustion, Toledo, O.
Thatcher Furnace Co., Garwood, N. J.
Twentieth Century Heating & Ventilating Co., Akron, O.
Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.

N. Y.
Viking Mfg. Corp., Dayton, Ohio.
XXth Century Heating & Ventilating Co., Akron, O.
Wise Furnace Co., Akron, O.
York Corp., York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING, GAS, STEEL

(Complete matched, gas-fired furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
Airtemp Div., Chrysler Corp., Dayton, Ohio.
Aladdin Heating Corporation, Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
American Furnace Company, St. Louis.
American Radiator and Standard Sanitary Corp., Pittsburgh. American Furnace Company, St. Louis.
American Radiator and Standard Sanitary Corp., Pitt.
Andrews Heating Company, Minneapolis.
Armstrong Furnace Co., Columbus, O.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Eryan, O.
Beck Engineering Combustion Kompany, St. Louis.
Bryant Corp., C. L., Cleveland.
Burke Stoker & Mfg. Co., Chicago.
Campbell Heating Company, Des Moines, Ia.
Campbell Heating Company, Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Chandler Company, Cedar Rapids, Ia.
Conco Corporation, Mendota, Ill.
Dalzen Manufacturing Co., Detroit.
Dornback Furnace & Foundry Co., Cleveland.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Electrogas Furnace Co., San Francisco.
Fitzgibbons Boiler Co., Inc., New York City.
Floral City Company, Monroe, Mich.
Forest City Foundries Co., Cleveland.
Fraser and Johnston Co., San Francisco.
Gasconaire, Inc., Detroit.
Gaul Air Conditioner Co., Dayton, Ohio.
General Electric Company, Bloomfield, N. J.
Concered Gas Light Co. Kalamazoo, Mich.

Gaul Air Conditioner Co., Dayton, Ohio.

General Electric Company, Bloomfield, N. J.
Ceneral Gas Light Co., Kalamazoo, Mich.

Glilen Company, J. L., Dowagiac, Mich.
Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis.

Hall-Neal Furnace Co., Indianapolis.
Heating Equipment Co., San Francisco.
Heatlox Furnaces, Inc., Tacoma, Wash.

Hell Co., The, Milwaukee.

Henry Furnace Company, Medina, Ohio.

Heil Co., The, Milwaukee.
Henry Furnace Company, Medina, Ohio.
Hess Warming & Ventilating Co., Chicago.
Holly Heating & Mfg. Co., So. Pasadena, Calif.
Huwer Heating Corp., Detroit.
Ideal Furnace Co., Detroit.
Ingersoil Steel & Disc Div., Borg-Warner Corp., Chicago.
Jackson & Church Co., Saginaw, Mich.
Johnston Gas Furnace Corp., North Hollywood, Calif.
Joliet Heating Corp., Joliet, Ill.
Kaustine Co., Inc., Perry, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kent & Co., Inc., J. King, St. Louis.
Koons Furnace Company, Danville, Ill.
Leeson Air Conditioning Corporation, Detroit.

Lennox Furnace Co., Marshalltown, Ia.

Lennox Furnace Co., Marshalitown, Ia.

Majestic Co., Huntington, Ind.
Marion Furnace Co., Detroit.

May-Fiebeger Co., Newark, O.

Mayflower Air-Conditioners, Inc., St. Paul, Minn.

Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace & Mgs. Co., Inc., Dallas, Texas.

Morrison Steel Products, Inc., Buffalo.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Eng. Co., Detroit.
New Mission Htg. & Vent. Co., San Francisco.
Northern Furnace & Supply Co., Billings, Mont.
Olsen Mgs. Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
Palmer Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Patten Co., J. V., Sycamore, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Perfection Stove Co., Cleveland.
Pernot & Rich, Inc., Los Angeles.
Premier Furnace Company, Dowagiac, Mich.
Reif-Rexoil, Inc., Buffalo.
Reznor Mfg. Co., Mercer, Pa.
Robinson Furnace Co., Chicago.
Round Oak Co., Dowagiac, Mich.
Royal Alr Conditioning Equipment Co., Alhambra, Calif.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
Ryniker Steel Products Company, Billings, Mont.
St. Louis Furnace Manufacturing Co., St. Louis.
Schill Mfg. Co., Crestline, O.
Schwab Furnace Co., Chicago.
Schwab Furnace Co., Milwaukee.
Scott-Newcomb, Inc., St. Louis.
Season-Aire Corporation of America. Detroit.
Security Manufacturing Co., Kansas City, Mo.
Standard Furnace & Supply Co., Omaha, Nebr.
United States Radiator Corp., Detroit.
Utility Fan Corporation, Los Angeles (Butane).
Viking Mfg. Corp., Dayton, Ohio.
Waterman-Waterbury Co., Minneapolis.
Wayne Oil Burner Co., Fort Wayne, Ind.
Wheeling Furnace Corporation, Martins Ferry, Ohio.
Wise Furnace Co., Akron, O.
Williamson Heater Co., Cincinnati.
Wood Industries. Inc., Gar, Detroit.

FURNACES, WARM AIR, AIR CONDITIONING, OIL, CAST IRON

(Complete matched, oil-burning furnace, fan, filter and humidifier unit)

(Complete matched, oil-burning furnace, fan, filter and humidifier unit)

Adelta Manufacturing Co., Philadelphia.
American Foundry & Furnace Co., Bloomington, Ill.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Auto-Heat Corporation, New York City.
Chandler Co., Cedar Rapids, Ia.
Coroaire Heater Corporation, Cleveland.
Excelsior Steel Furnace Co., Chicago.
Hess-Snyder Co., Massillon, Ohio.
International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
May Oil Burner Corporation, Baltimore.
Montag Stove & Furnace Works, Portland, Ore.
Mueller Furnace Co., L. J., Milwaukee.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, Ohio.
St. Louis Furnace Manufacturing Co., St. Louis.
Schwab Furnace Co., Milwaukee.
Sloux City Foundry & Boiler Co., Sloux City, Ia.
Stainless & Steel Products Co., Saint Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Westwick & Son, Inc., John, Galena, Ill.
Williams Oil-O-Matic Heating Corporation, Bloomington, Ill.

Wise Furnace Co., Akron, O.

FURNACES, WARM AIR, AIR CONDITIONING, OIL, STEEL

(Complete matched, stoker-furnace, fan, filter, and humidifier unit) (Complete matched, stoker-furnace, fan, filter, and humidifier uni Adeita Manufacturing Co., Philadelphia. Airtemp Division Chrysler Corp., Dayton, Ohio. Allis-Chalmers Mfg. Co., Milwaukee. American Air Conditioning Corp., Sebastopol, Calif. American Furnace Co., St. Louis. American Radiator & Standard Sanitary Corp., Pittsburgh. American Stove Co., Lorain, O. Anchor Post Fence Co., Heating Div., Baltimore. Andrews Heating Co., Minneapolis. Arcweld Manufacturing Co. Inc. Seattle, Wash Arcweld Manufacturing Co., Inc., Seattle, Wash. Armstrong Furnace Co., Columbus, O. Atlas Heating & Ventilating Co., Ltd., San Francisco. Auburn Burner Co., Auburn, Ind. Auburn Foundry, Inc., Stoker Div., Auburn, Ind. Auto-Heat Corporation, New York City.

Automatic Burner Corporation, Chicago.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustian Kompany, St. Louis.
Bethlehem Foundry & Machine Co., Bethlehem, Pa.
Bovee Furnace Works. Waterloo, Ia.
Bryant Corp., C. L., Cleveland.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Cary Manufacturing Co., Wappaca, Wis.
Century Engineering Corporation, Cedar Rapids, Ia.
Chandler Co., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago.
Cleveland Steel Products Corp., Torridheet Div., Cleveland.
Conco Corporation, Mendota, Ill.
Crane Company, Chicago.
Dalzen Manufacturing Co., Detroit.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deshler Foundry & Machine Works, Deshler, O.
Des Moines Stove Repair Co., Des Moines, Ia.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Electrol Mfg. Co., Passalc, N. J.
Evans Corp., George, Moline, Ill.
Farquhar Furnace Co., Wilmington, O.
Fitzgibbon Boiler Co., Inc., New York City.
Floral City Co., Monroe, Mich.
Forest City Foundries Co., Cleveland, O.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gasoroil Mfg. Corp., Genoa City, Wis.
Gehrl Co., Tacoma, Wash.
General Electric Co., Bloomfield, N. J.
General Heating Products Co., Minneapolis.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gillen Co., J. L., Dowagiac, Mich.
Glasby Manufacturing Co., Inc., J. P., Bloomfield, N. J.
Green Colonial Furnace Co., Indianapolis, Ind.
Harvey-Whipple, Inc., Springfield, Mass.
Heil Co., Miwaukee.
Henry Furnace Co., Medina, O.
Hess Warming & Ventilating Co., Inc., J. P., Honoman Specialty Co., Inc., Indianapolis, Ind.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Holtentot Co., Inc., Onasha, Neby.
Heil Co., Miwaukee.
Henry Furnace & Foundry Corp., Coldwater, Mich.
Hotentot Co., Inc., Onasha, Neby.
Heil Co., Missellion, O.
Hess-Snyder Co., Measilloon, I.
Honson & Co., Marshalltown, I.
Little Burner Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Spracuse, N. Y.
Ketth Furnace Co., Dan Mille, Automatic Burner Corporation, Chicago. Bard Mfg. Co., Bryan, O.

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Michigan Tank & Furnace Corp., Lochinvar Products Div., Detroit.

Montag Stove & Furnace Works, Portland, Ore.

Morrison Steel Products, Inc., Buffalo.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Eng. Co., Detroit.
Nelson Company, Detroit.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Northwest Stove & Furnace Works, Portland, Ore.
Nu-Way Corp., Rock Island, Ill.

Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating & Manufacturing Co., St. Petersburg, Fla.
Patten Co., J. V., Sycamore, Ill.

Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Perfection Stove Co., Cleveland.
Petroleum Heat & Power Co., Stamford, Conn.
Quaker Mfg. Co., Chicago.
Quincy Stove Manufacturing Co., Quincy, Ill.
Radiation Furnace Corp., Benton Harbor, Mich.
Ray Oil Burner Co., San Francisco.
Reif-Rexoll, Inc., Buffalo.
Robinson Furnace Co., Chicago.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Rudy Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Schwab Furnace Co., Milwaukee.

Sandberg Co., H. J., Portland, Ore.
Schwab Furnace Co., Milwaukee.
Scott-Newcomb, Inc., St. Louis.

Season-Aire Corporation of America, Detroit.

Season-Aire Corporation of America, Detroit.
Silent Sioux Oil Burner Corp., Orange City, Ia.
Skinner Htg. & Vent. Co., Div. of St. Louis Blow Pipe & Heater Co., Inc., St. Louis.
Stainless & Steel Products Co., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Sundstrand Engineering Co., Rockford, Ill.
Sure Comfort Furnace Co., Berwyn, Ill.
Syncro-Flame Burner Corp., Willimantic, Conn.

Syncro-Flame Burner Corp., Willimantic, Conn.

Syncro-matic Corporation, Milwaukee.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corp., Detroit.

Viking Mfg. Corp., Dayton, O.

Waterman-Waterbury Co., Minneapolis.

Wayne Oil Burner Co., Fort Wayne, Ind.
Weatherall Engineers, Inc., Providence, R. I.
Western Blower Co., Seattle, Wash.
Westwick & Son, Inc., John, Galena, Ill.
Wheeling Furnace Corporation, Martins Ferry, Ohio.

Williamson Heater Co., Cincinnati.

Williamson Heater Co., Cincinnati.
Wood Industries, Inc., Gar, Detroit.
 York-Heat Div., York-Shipley, Inc., York, Pa.
York Corp., York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING. STOKER, CAST IRON

(Complete matched, stoker-furnace, fan, filter, and humidifier unit)

Adelta Manufacturing Co., Philadelphia.

American Foundry & Furnace Co. Bloomington. Ill.

American Furnace & Foundry Co., Milan, Mich.

American Radiator & Standard Sanitary Coro. Pittsburgh.

Auburn Foundry, Inc., Stoker Div., Auburn, Ind.

Bovee Furnace Works, Waterloo, Ia.

Chandler Co., Cedar Rapids, Ia.

Excelsior Stove & Mfg. Co., Quincy. Ill.

Forest City Foundries Co., Cleveland. O.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

Grossenbacher Furnace Co., Inc., St. Louis.

Hess-Snyder Co., Massillon, O.

Homer Furnace & Foundry Corp., Coldwater, Mich.

International Heater Co., Utica, N. Y.

Keith Furnace Co., Des Moines, Ia.

MaGirl Foundry & Furnace Works, P. H., Bloomington. Ill.

Montag Stove & Furnace Works, Portland. Ore.

Mueller Furnace Co., L. J., Milwaukee.

St. Louis Furnace Manufacturing Co., St. Louis. Mo.

Stainless & Steel Products Co., St. Paul, Minn.

Sloux City Foundry & Boller Co., Sloux City, Ia.

Williamson Heater Co., Cincinnati.

York Corporation, York, Pa. Adelta Manufacturing Co., Philadelphia.

FURNACES, WARM AIR, AIR CONDITIONING, STOKER, STEEL

(Complete matched, stoker-furnace, fan, filter, and humidfier)

Allis-Chalmers Mfg. Co., Milwaukee, American Furnace Co., St. Louis. American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Anchor Stove & Range Co., New Albany, Ind.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Burner Co., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany. St. Louis. Back Engineering Combustion Kompany. St. Louis.
Bovee Furnace Works. Waterloo. Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Chandler Co., Cedar Rabids. Ia.
Chicago Steel Furnace Co., Chicago.
Conco Corporation. Mendota, Ill.
Deshler Foundry & Machine Works, Deshler. O.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Farquhar Furnace Co., Wilmington. O.
Fitzgibbons Boiler Co., Inc., New York City.
Forest City Foundries Co., Cleveland.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., Inc., St. Louis.
Hall-Neal Furnace Co., Indianapolis, Ind.
Heast-Snyder Co., Massillon, O.
Hess Warming & Ventilating Co., Chicago.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Ingerson & Church Co., Saginaw, Mich.

Iron Fireman Manufacturing Co. Clevel
Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Kol-Master Corporation, Oregon, Ill.
Koons Furnace Co., Danville, Ill.
Lennox Furnace Co., Marshalltown, Ia.
McPherson Furnace & Supply Co.. Porth
Majestic Company, Huntington, Ind.
May-Fiebeger Co., Newark, O.
Meyer Furnace Co., Peoria, Ill. Portland, Ore.

National Manufacturing & Engineering Co., Detroit.

National Manufacturing & Engineering Co., Detroit.
Nelson Company, Detroit.
Northwest Stove & Furnace Works, Portland, Ore.

Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
Premier Furnace Co., Dowagiac, Mich.
Robinson Furnace Co., Chicago.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
St. Louis Furnace Manufacturing Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.
Schwab Furnace Co., Milwaukee.
Stainless & Steel Products Co., St. Paul, Minn.
Stok-A-Fire Co., Inc., University City, Mo.
Stokermatic Company, Salt Lake City, Utah.
Sun-Fire Stoker Corporation, New Albany, Ind.
Sure Comfort Furnace Co., Berwyn, Ill.
Syncromatic Corporation, Milwaukee.
Waterman-Waterbury Co., Minneapolis.
Williamson Heater Co., Cincinnati.
York Corporation, York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, COAL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corp., Dayton, O.
American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Armstrong Furnace Co., Columbus, O.
Fitzgibbons Boiler Co., Inc., New York City.
Fioral City Co., Monroe, Mich.
Hall-Neal Furnace Co., Indianapolis.
Joliet Heating Corporation, Joliet, Ill.
Kehm Corporation, Chicago.
Lennox Furnace Co., Marshalltown, Inc.

Kehm Corporation, Chicago.

Lennox Furnace Co., Marshalltown, Ia.

Olsen Manufacturing Co., C. A., Elyria, O.
Parker Heating & Mfg. Co., St. Petersburg, Fla.

Peerless Foundry Co., Inc., Indianapolis, Ind.
Smith Heater Co., Peter, Detroit.

Syncromatic Corporation, Milwaukee.

Viking Manufacturing Corporation, Dayton, O.

Williamson Heater Co., Cincinnati, O. (Cast Iron)

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, CAST IRON

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corporation, Dayton, O. American Foundry & Furnace Co., Bloomington, Ill. American Furnace Co., St. Louis. American Fadiator & Standard Sanitary Corp., Pittsburgh. Bastian-Morley Co., Inc., LaPorte, Ind. Bryant Heater Co., Cleveland.

Burke Stoker & Mfg. Co., Chicago.
Forest City Foundries Co., Cleveland.
General Electric Co., Air Conditioning & Commercial Refrigeration Dept., Bloomfield, N. J.

eration Dept., Biomineid, N. J.

Hall-Neal Furnace Co., Indianapolis.

Mueller Furnace Co., L. J., Milwaukee.

Olsen Manufacturing Co., C. A., Elyria, O. Richmond Radiator Co., Inc., Uniontown, Pa.

Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y. Viking Mfg. Corp., Dayton, O. York Corporation, York, Pa.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, GAS, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

Airtemp Div., Chrysler Corporation, Dayton, O. Aladdin Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif. Alladin Heating & Air Conditioning Co., Lawndale, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, O.
Burke Stoker & Mfg. Co., Chicago.

Conco Corporation, Mendota, Ill.
Dalzen Manufacturing Co., Detroit.
Electrogas Furnace Co., San Francisco.
Evanoil Div., Evans Products Co., Detroit.

Forest City Foundries Co., Clevland.
Fraser & Johnston Co., San Francisco.
General Gas Light Co., Kalamazoo, Mich.
Gibraltar Engineering Co., Los Angeles.
Green Colonial Furnace Co., Des Molnes, Ia.

Hall-Neal Furnace Co., Indianapolis.
Heating Equipment Co., San Francisco.
Holly Heating & Mfg. Co., So. Pasadena, Calif.
Huwer Heating Corp., Detroit.
Ideal Furnace Co., Detroit.
Kehm Corporation, Chicago.

Kent & Co., Inc., J. King, St. Louis. Leeson Air Conditioning Corporation, Detroit. Lennox Furnace Co., Marshalltown, Ia.

Majestic Co., Huntington, Ind. Marion Furnace Co., Detroit.

Marion Furnace Co., Detroit.

May-Fiebeger Company, Newark, O.

Mayflower Air Conditioners, Inc., St. Paul, Minn.

Meyer Furnace Co., Peoria, Il.

Morrison Steel Products, Inc., Buffalo, N. Y.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Eng. Co., Detroit.

Olsen Manufacturing Corp., Phoenix, Ariz.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Patten Co., J. V., Sycamore, Ill.

Payne Furnace & Supply Co., Beverly Hills, Calif.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Perfection Stove Co., Cleveland.
Reznor Manufacturing Co., Mercer, Pa.

Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.

Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
Rudy Furnace Co., Dowagiac, Mich.
St. Louis Furnace Manufacturing Co., St. Louis.
Season-Aire Corporation of America, Detroit.
Viking Mfg. Corp., Dayton, O.
Wayne Oil Burner Co., Fort Wayne, Ind.
Wood Industries, Inc., Gar, Detroit.

FURNACES, WARM AIR, AIR CONDITIONING, UTILITY ROOM, OIL, STEEL

(Complete matched furnace with burner, fan, filter, humidifier)

(Complete metched furnace with burner, fan, filter, hum
Airtemp Div., Chrysler Corporation, Dayton, O.
American Furnace Co., St. Louis.
American Stove Co., Lorain Div., Lorain, O.
Anchor Post Fence Co., Heating Div., Baltimore.
Auburn Burner Co., Auburn, Ind.
Bard Manufacturing Co., Bryan, O.
Dalzen Manufacturing Co., Detroit, Mich.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Evanoil Div., Evans Products Co., Detroit.
Gasoroil Mfg. Corp., Genoa City, Wis.
General Electric Co., Bloomfield, N. J.
Hall-Neal Furnace Co., Indianapolis, Ind.
Harvey-Whipple, Inc., Springfield, Mass.
Hoffman Specialty Co., Inc., Indianapolis.
Huwer Heating Corp., Detroit.
Interstate Metal Products Co., Inc., Chicago.
Joliet Heating Corporation, Jollet, Ill.
Kruse Company, Indianapolis.
Lennox Furnace Co., Marshalltown, Ia.
Little Burner Co., Inc., H. C., San Rafael, Calif.
McPherson Furnace & Supply Co., Portland, Ore.
Majestic Co., Huntington, Ind.
Marion Furnace Co., Detroit.

Little Burner Co., Inc., H. C., San Rafael, Calif.
MePherson Furnace & Supply Co., Portland, Ore.

Majestic Co., Huntington, Ind.
Marion Furnace Co., Detroit.

May-Fiebeger Co., Newark, O.
Montag Stove & Furnace Works, Portland, Ore.

Morrison Steel Products, Inc., Buffalo.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Eng. Co., Detroit.
Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.
Northwest Stove & Furnace Works, Portland, Ore.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Patten Co., J. V., Sycamore, Ill.
Perfection Stove Co., Cleveland.

Premeter Furnace Co., Dowaglac, Mich.
Quaker Mfg. Co., Chicago.

Quincy Stove Manufacturing Co., Quincy, Ill.

Round Oak Co., Dowaglac, Mich.
Sandberg Co., H. J., Portland, Ore.
Season-Aire Corporation of America, Detroit.
Silent Sioux Oil Burner Corp., Orange City, Ia.

Syncromatic Corporation, Milwaukee.

Viking Manufacturing Corp., Dayton, O.

Wayne Oil Burner Co., Fort Wayne, Ind.
Weatherall Engineers, Inc., Providence, R. I.
Wood Industries, Inc., Gar, Detroit.

York-Heat Div., York-Shipley, Inc., York, Pa.
York Corporation, York, Pa.

FURNACES, WAR AIR, FLOOR, GRAVITY

(For suspension beneath floor)

Aladdin Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
American Radiator & Standard Sanitary Corp., Pittsburgh.

American Radiator & Standard Sanitary Corp., Pittsbi
(Gas. Oil)
Andes Range & Furnace Corp., Geneva, N. Y.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Beck Engineering Combustion Kompany, St. Louis.
Capps, Joseph, Inc., South Gate, Calif.
Cole Hot Blast Manufacturing Co., Chicago. (Gas and Oil)
Coleman Lamp & Stove Co., Wichita, Kan.
Dallman Supply Co., Sacramento, Calif.
Day & Night Manufacturing Co., Monrovia, Calif. (Gas)
East Anaheim Sheet Metal Works, Long Beach, Calif.
Electrogas Furnace Co., San Francisco, Calif. (Gas)

• Advertisement in this issue. See Index to Advertisers, page 314.

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Fraser & Johnston Co., San Francisco.

Gillen Company, J. L., Dowagiac, Mich, Heating Equipment Co., San Francisco. (Gas) Holly Heating & Mfg. Co., So. Pasadena, Calif.

Hotstream Heater Co., Cleveland.
Ideal Heating Corp., Los Angeles. (Gas)
King Metal Co., Oklahoma City, Okla.
Koons Furnace Co., Danville, Ill.
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
Miller Floor Furnace Co., Oakland, Calif.
Mission Water Heater Co., Los Angeles.
Monarch Heating Co., Los Angeles.
Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.
Moore Corporation, Joliet, Ill.

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Gas)

Mueller Furnace Co., L. J., Milwaukee. (Gas)
Norge Heating & Cond. Div., Borg-Warner Corp., Detroit. (Oil)
O'Keefe & Merritt Co., Los Angeles.
Pacific Gas Heating Co., San Francisco. (Gas)
Payne Furnace & Supply Co., Beverly Hills, Calif. (Gas)
Pennsylvania Furnace & Iron Co., Warren, Pa. (Gas)
Pioneer Water Heater Co., Los Angeles.
Quaker Manufacturing Co., Chicago. (Oil)
Rook Island Stove Co., Rock Island, Ill. (Coal)
Royal Air Conditioning Equipment Co., Alhambra, Calif. (Gas)
Stoker-Lad Co., Tacoma, Wash.
Surface Combustion, Toledo, O. (Gas)
Sutphen & Co., J. W., Los Angeles.
Tennessee Enamel Mfg. Co., Nashville, Tenn.
U-Ni-Matic Heating Systems, Inc., Los Angeles. (Gas)
Utility Fan Corporation, Los Angeles. (Gas, Butane)
Ward Heater Co., Los Angeles, Calif. (Gas)
Woods-Evertz Stove Co., Springfield, Mo.
Zink Co., John, Tulss, Okla. (Gas)

Zink Co., John, Tulsa, Okla. (Gas)

FURNACES, WARM AIR, GRAVITY, COAL, CAST IRON

FURNACES, WARM AIR, GRAVITY, COAL, CAST IRON

Adelta Manufacturing Co., Philadelphia.
Agricola Furnace Co., Inc., Gadsden, Ala.
Airtemp Div., Chrysler Corp., Dayton, O.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Andes Range & Furnace Corp., Geneva, N. Y.
Barry Furnace Co., Hamilton, O.
Bergstrom Mfg. Corp., Neenah, Wis.
Bovee Furnace Works, Waterloo, Ia.
Columbus Heating & Ventilating Co., Columbus, O.
Crane Company, Chicago.
Danville Stove & Mfg Co., Danville, Pa.

Des Moines Stove & Mfg Co., Danville, Pa.

Des Moines Stove & Mfg Co., Detroit, Mich.

Dowagiac Steel Furnace Co., Detroit, Mich.

Edwards Furnace Co., Wellsboro, Pa.
Excelsior Steel Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Farris Furnace Co., Springfield, Ill.
Faultless Heater Corp., Cleveland.
Favorite Manufacturing Co., Plqua, O.
Floyd-Wells Co., Royersford, Pa.

Forest City Foundries Co., Cleveland.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Fuller-Warren Co., Milwaukee.
Green Colonial Furnace Co., Div. Liberty Foundry Co., St. Louis.
Fuller-Warren Co., Milwaukee.
Green Colonial Furnace Co., Div. Liberty Foundry Co., St. Louis.
Fuller-Warren Co., Milwaukee.
Hall-Neal Furnace Co., Indianapolis.
Hallstead Iron Foundry, Hallstead, Pa.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky.

Henry Furnace Co., Massillon, O.
Hess-Snyder Co., Massillon, O.
Hess-Snyder Co., Massillon, O.
Hess-Snyder Co., Milanapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
International Heater Co., Utica, N. Y.
Iowa Foundry Co., Stoux City, Ia.
Katelman Foundry & Mig. Co., Council Bluffs, Iowa.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Kleln Stove Co., Philadelphia, Pa.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co

Majestic Co., Huntington, Ind.
Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Marshall, Mich.
May-Flebeger Co., Newark, O.
Meyer Furnace Co., Peoria, Ill.
Miller Range & Furnace Co., Wm., Cincinnati, O.
Montag Stove & Furnace Works, Portland, Ore.
Moore Corp., Joliet, Ill.
Mount Verron Furnace & Mfg. Co. Mt. Verron

Moore Corp., Joliet, Ill.

Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Mueller Furnace Co., L. J., Milwaukee, Wis.

Oakland Foundry Co., Belleville, Ill.

Olsen Mfg. Co., C. A., Elyria, O.

Orbon Stove Co., Belleville, Ill.

Peerless Foundry Co., Indianapolis, Ind.

Pittsburgh Furnace Parts Co., Pittsburgh, Pa.

Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Dowagiac, Mich.
Reynolds Manufacturing Co., Springfield, Mo.
Robinson Furnace Co., Chicago, Ill.
Rock Island Stove Co., Rock Island, Ill.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
St. Clair Foundry Corp., Centralia, Ill.
St. Louis Furnace Mfg. Co., St. Louis, Mo.
Schill Mfg. Co., Crestline, O.
Schwab Furnace Co., Milwaukee, Wis.
Security Manufacturing Co., Kansas City, Mo.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Spear Stove and Heater Co., James, Philadelphia.
Stainless & Steel Products Co., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Thatcher Furnace & Supply Co., Omaha, Nebr.
Thatcher Furnace Co., Garwood, N. J.
Twentieth Century Heating & Ventilating Co., Akron, O.
Union Manufacturing Co., Inc., Boyertown, Pa.
United States Radiator Corp., Detroit, Mich.
Western Furnaces, Inc., Tacama, Wash.
Western Furnaces, Inc., Tacama, Wash.
Westwick & Son, Inc., John, Galena, Ill.
Williamson Heater Co., Cincinnati, O.
Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, COAL, STEEL

Airte ip Div., Chrysler Corp., Daywa, O.
Ame ican Furnace Co., St. Louis, Mo.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Bard Manufacturing Co., Bryan, O.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Chandler Co., Cedar Rapids, Ia.
Chandler Co., Cedar Rapids, Ia.
Conco Corporation, Mendota, Iil.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
Deshler Foundry & Mach. Wks., Deshler, O.
Des Moines Stove Repair Co., Des Moines, Ia.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Excelsior Steel Furnace Co., Chicago, Iil.
Farquhar Furnace Co., Wilmington, O.
Faultless Heater Corp., Cleveland, O.
Front Rank Furnace Co., Cleveland, O.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gascol Furnace Co., Pittsburgh (Combination Coal and Gas)
Gehri Co., Tacoma, Wash.
Green Colonial Furnace Co., St. Louis, Mo.

Gascol Furnace Co., Pittsburgh (Combination Coal and Gehri Co., Tacoma, Wash.
Green Colonial Furnace Co., Des Moines, Ia.
Grossenbacher Furnace Co., St. Louis, Mo.
Hall-Neal Furnace Co., Indianapolis, Ind.
Hart Mfg. Co., Louisville, Ky.
Henry Furnace Company, Medina, O.
Hess-Snyder Co., Massillon, O.
Hess Warming & Ventilating Co., Chicago, Ill.
Home Stove Co., Indianapolis, Ind.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
International Heater Co., Utica, N. Y.
Jackson & Church Co., Saginaw, Mich.
Joliet Heating Corp., Joliet, Ill.
Keith Furnace Co., Des Moines, Ia.
Koons Furnace Co., Danville, Ill.
Leanox Furnace Co., Danville, Ill.
Lennox Furnace Co., Marshalltown, Ia.
Lookout Boller & Mfg. Co., Chattanooga, Tenn.
McPherson Furnace & Supply Co., Portland, Ore.
Majestic Co., Huntington, Ind.
Majestic Furnace Co., Seattle, Wash.
Marshall Furnace Co., Marshall, Mich.

Majestic Co., Huntington, Ind.
Majestic Furnace Co., Seattle, Wash.
Marshall Furnace Co., Marshall, Mich.
May-Flebeger Co., Newark, O.
Meyer Furnace Co., Peorla, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Mueller Furnace Co., L. J., Milwaukee, Wis.
National Mfg. & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Portland, Ore.
Nugent Furnaces, Thos., New York City.
Olsen Mfg. Co., C. A., Elyria, O.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Peerless Foundry Co., Indianapolis, Ind.
Pennsylvania Engineering Works, New Castle, Pa.
Pennsylvania Furnace Parts Co., Warren, Pa.
Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
Portland Stove Foundry Co., Portland, Me.
Premer Furnace Co., Dowagiac, Mich.
Ramey Mfg. Co., Columbus, O.
Ribside Furnace Co., Chicago.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Index to Advertisers, page \$14.

Sandberg Co., H. J., Portland, Ore.
Schill Mfg. Co., Crestline, O.
Schwab Furnace Co., Milwaukee, Wis.
Sioux City Foundry and Boiler Co., Sioux City, Ia.
Spencer Heater Div., Aviation Corp., Williamsport, Pa.
Stainless & Steel Products Co., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Stanton Heater Co., Martins Ferry, O.
Sure Comfort Furnace Co., Berwyn, Ill.
Syncromatic Corporation, Milwaukee.
Thatcher Furnace Company, Garwood, N. J.

Syncromatic Corporation, Milwaukee.
Thatcher Furnace Company, Garwood, N. J.
Twentlieth Century Heating & Ventilating Co., Akron, O.
United States Radiator Corp., Detroit.
Viking Mfg. Co., Dayton, O.
Waterman-Waterbury Co., Minneapolis, Minn.
Wayne Oil Burner Co., Fort Wayne, Ind.
Wheeling Furnace Corporation, Martins Ferry, O.
Williamson Heater Co., Cincinnati, O.
Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, GAS, CAST IRON

American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Bryant Heater Co., Cleveland, O.
Burke Stoker & Mfg. Co., Chicago.
Chandler Co., Cedar Rapids, Ia.
Favorite Manufacturing Co., Piqua, O.

Forest City Foundries Co., Cleveland, O.
Hart Mfg. Co., Louisville, Ky.

Henry Furnace Company, Medina, O.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.
Jackson Sheet Metal Works, Ogden. Utah. (Combination Iron and Steel)

and Steel)

and Steel)
Johnson Gas Furnace Corp., North Hollywood, Calif.
Kelsey Heating Co., Syracuse, N. Y.
Marshall Furnace Co., Marshall, Mich.

Mueller Furnace Co., L. J., Milwaukee, Wis.
Olsen Manufacturing Co., C. A., Elyria, O.
Richmond Radiator Co., Inc., Uniontown, Pa.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Company, Ashland, O.
Sloux City Foundry & Boiler Co., Sioux City, Ia.
Surface Combustion, Toledo, O.
Twentieth Century Heating & Ventilating Co., Akron, O.
Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.
York Corporation, York, Pa.

FURNACES, WARM AIR, GRAVITY, GAS, STEEL

Airtemp Div., Chrysler Corp., Dayton, O. Aladdin Heating Corp., Oakland, Calif. Allied Heating Corp., Oakland, Calif.
Allied Heating & Air Conditioning Co., Lawndale, Calif.
American Furnace Co., St. Louis, Mo.
American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Armstrong Furnace Co., Columbus, O.
Atlas Heating & Ventilating Co., Ltd., San Francisco, Calif.
Bard Manufacturing Company, Bryan, Ohio.
Beck Engineering Combustion Kompany, St. Louis. Beck Engineering Combustion Kompany, St. Louis. Burke Stoker & Mfg. Co., Chicago.
Bryant Corp., C. L., Cleveland, O. Calkins & Pearce, Columbus, O. Calkins & Pearce, Columbus, O. Campbell Heating Co., Des Moines, Ia.
Cocking, Geo. J., Santa Ana, Calif.
Coleman Lamp & Stove Company, Wichita, Kansas.

Conco Corporation, Mendota, Ill.

Dallman Supply Co., Sacramento, Calif.
Dornback Furnace & Foundry Co., Cleveland.
Electrogas Furnace Co., San Francisco, Calif.
Forest City Foundries Co., Cleveland, O.
Fraser and Johnston Co., San Francisco.

Gascol Furnace Co., Pittsburgh. (Comb. Coal and Gas)
Green Colonial Furnace Co., Des Moines, Ia.

Hall-Neal Furnace Co., Indianapolis, Ind.
Heating Equipment Co., San Francisco.

Heating Equipment Co., San Francisco.

Henry Furnace Company, Medina, O.
Hess-Snyder Co., Massillon, O.
Holly Heating & Mfg. Co., So. Pasadena, Calif.
Hotentot Company, Inc., Omaha, Nebr.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, M
Johnston Gas Furnace Corp., North Hollywood, Calif.
Lennox Furnace Co., Marshalltown, Ia.
Marion Furnace Co., Detroit.

May-Flebeger Co., Newark, O.

Meyer Furnace Co., Peorla, Ill.

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Meyer Furnace Co., Peorla, Ill.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis. National Mfg. & Engineering Co., Detroit.
New Mission Heating & Ventilating Co., San Francisco. Northern Furnace & Supply Co., Billings, Mont. Nugent Furnaces, Thomas, New York City.
Olsen Mfg. Co., C. A., Elyria, O. Pacific Gas Heating Company, San Francisco. Parker Heating & Manufacturing Co., St. Petersburg, Fla.
Payne Furnace & Supply Co., Beverly Hills, Calif. Pennsylvania Furnace & Iron Co., Warren, Pa. Perfection Stove Co., Cleveland.

Royal Air Conditioning Equipment Co., amambra, Calif.

Royal Air Conditioning Equipment Co., Amambra, Co.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
Ryniker Steel Products Company, Billings, Mont.
St. Louis Furnace Mfg. Co., St. Louis.
Schill Mfg. Co., Crestline, Ohio.
Scott-Newcomb, Inc., St. Louis, Mo.
Season-Aire Corporation of America, Detroit.
Security Manufacturing Co., Kansas City, Mo.
Sonner Burner Co., Winfield, Kansas.
Standard Furnace & Supply Company, Omaha, Nebr.
United States Radiator Corp., Detroit.

Waterman-Waterbury Co., Minneapolis, Minn.

Williamson Heater Co., Cincinnati, O.
Williamson Heater Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, OIL, CAST IRON

FURNACES, WARM AIR, GRAVITY, OIL, CAST IRO
Adelta Manufacturing Co., Philadelphia.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace & Foundry Co., Milan, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Chandler Co., Cedar Rapids, Ia.
Edwards Furnace Co., Wellsboro, Pa.
Hart & Crouse Corporation, Utica, N. Y.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.
International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Marshall Furnace Co., Marshall, Mich.
Montag Stove & Furnace Works. Portland. Ore.
Mount Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee.
St. Louis Furnace Mfg. Co., St. Louis.
Sioux City Foundry & Boller Co., Sloux City, Ia.
Stainless & Steel Products Co., St. Paul, Minn.
Thatcher Furnace Co., Garwood, N. J.

FURNACES, WARM AIR, GRAVITY, OIL, STEEL

Airtemp Division, Chrysler Corp., Dayton, O. American Air Conditioning Corp., Sebastopol, Calif. American Furnace Co., St. Louis. American Radiator & Standard Sanitary Corp., Pittsburgh. American Furnace Co., St. Louis.

American Radiator & Standard Sanitary Corp., Pittsburgh.

Andrews Heating Co., Minneapolis.

Aroweld Mfg. Co., Inc., Seattle, Wash.

Armstrong Furnace Co., Columbus, O.

Bard Manufacturing Co., Bryan, O.

Beck Engineering Combustion Kompany, St. Louis.

Bovee Furnace Works, Waterloo, Ia.

Campbell Heating Co., Des Moines, Ia.

Cary Mfg. Co., Waupaca, Wis.

Chandler Co., Cedar Rapids, Ia.

Duo-Therm Div., Motor Wheel Corporation. Lansing, Mich.

Evanoil Heater Div., Evans Products Co., Detroit.

Farquhar Furnace Co., Wilmington, O.

Forest City Foundries Co., Cieveland.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

Gasoroil Mfg. Corp., Genoa City, Wis.

Gehri Co., Tacoma, Wash.

Gilbert & Barker Mfg. Co., West Springfield, Mass.

Gillen Co., J. L., Dowagiac, Mich.

Green Colonial Furnace Co., Indianapolis.

Henry Furnace Co., Massillon, O.

Hess-Snyder Co., Massillon, O.

Hess-Snyder Co., Massillon, O.

Hess Warming & Ventilating Co., Chicago.

Hotentot Co., Inc., Omaha, Nebr.

Ideal Furnace Co., Detroit.

Johnston Gas Furnace Corp., North Hollywood, Calif.

Joliet Heating Corp., Joliet, Ill.

Keith Furnace Co., Des Moines, Ia.

Koons Furnace Co., Danville, Ill.

Kruse Co., Indianapolis.

Lennox Furnace Co., Marshalltown, Ia.

Little Burner Co., Inc., H. C., San Rafael, Calif.

Little Burner Co., Inc., H. C., San Rafael, Calif.

May-Flebeger Co., Newark, O.
Meyer Furnace Co., Peorla, Ill.

Michigan Tank & Furnace Corp., Lochinvar Products Div.

Michigan Tank & Furnace Corp., Lochinvar Products Div. Detroit.

Montag Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee.

Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit.

Northwest Stove & Furnace Works, Portland, Ore.

Nugent Furnaces, Thomas, New York Ctiy.

Olsen Mfg. Co., C. A., Elyria, O.
Pacific Gas Heating Co., San Francisco.
Parker Heating & Manufacturing Co., St. Petersburg, Fla.

Peerless Foundry Co., Indianapolis.
Perfection Stove Co., Cleveland.
Portland Stove Foundry Co., Portland, Me.

Premier Furnace Co., Dowagiac, Mich.
Quaker Manufacturing Co., Chicago.

Quincy Stove Manufacturing Co., Quincy, Ill.
Rock Island Stove Co., Rock Island, Ill.
Rosebraugh Co., W. W., Salem, Ore.

Round Oak Co., Dowagiac, Mich.

Rybolt Heater Co., Ashland, O.
St. Louis Furnace Mfg. Co., St. Louis.
Sandberg Co., H. J., Portland, Ore.

Index to Advertisers, page 314.

Scott-Newcomb, Inc., St. Louis.
Stainless & Steel Products Co., St. Paul, Minn.
Standard Furnace & Supply Co., Omaha, Nebr.
Sure Comfort Furnace Co., Berwyn, Ill.
Syncromatic Corporation, Milwaukee.
Thatcher Furnace Co., Garwood, N. J.
United States Radiator Corp., Detroit.
Viking Mfg. Corp., Dayton, O.
Waterman-Waterbury Co., Minneapolis.
Wayne Oil Burner Co., Fort Wayne, Ind.
Western Blower Co., Seattle, Wash.
Williamson Heater Co., Cincinnati.
Wise Furnace Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, STOKER, CAST IRON

Adelta Manufacturing Co., Philadelphia.

American Furnace & Foundry Co., Milan, Mich.

American Radiator & Standard Sanitary Corp., Pittsburgh.

Anchor Stove & Range Co., New Albany, Ind.

Bovee Furnace Works, Waterloo, Ia.

Chandler Co., Cedar Rapids, Ia.

Excelsior Stove & Mfg. Co., Quincy, Ill.

Forest City Foundries Co., Cleveland.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.

Grossenbacher Furnace Co., Inc., St. Louis.

Hall-Neal Furnace Co., Indianapolis.

Hess-Snyder Co., Massillon, O.

Grossenbacher Furnace Co., Inc., St. Louis.

Hall-Neal Furnace Co., Indianapolis.
Hess-Snyder Co., Massillon, O.
Ideal Furnace Co., Detroit.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Inc., Syracuse, N. Y.

Majestic Co., Huntington, Ind.
Marshall Furnace Co., Marshall, Mich.

Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee. (Double Radiator)

Premier Furnace Co., Dowagiac, Mich.

Premier Furnace Co., Dowagiac, Mich.

Schwab Furnace Co., Milwaukee, Wis.
Sloux City Fdy. & Boller Co., Sloux City, Ia.
Stainless & Steel Products Co., St. Paul, Minn.
Twentieth Century Heating & Ventilating Co., Akron, O.

XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, STOKER, STEEL

American Furnace Co., St. Louis.
American Radiator & Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Beck Engineering Combustion Kompany, St. Louis.
Campbell Heating Co., Des Moines, Ia.
Floral City Co., Monroe, Mich.
Forest City Foundries Co., Niagara Furnace Div., Cleveland.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
Hall-Neal Furnace Co., Indianapolis.
Henry Furnace Co., Massillon, O.
Hess-Snyder Co., Massillon, O.
Hess Warming & Ventilating Co., Chicago.
Ideal Furnace Co., Detroit.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Keith Furnace Co., Des Moines, Ia.
Lennox Furnace Co., Marshalltown, Ia.
Majestic Co., Huntington, Ind.

Majestic Co., Huntington, Ind.

Majestic Co., Huntington, Ind.

May-Flebeger Co., Newark, O.

Meyer Furnace Co., Peoria, Ill.

Montag Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee, Wis.

Northwest Stove & Furnace Works, Portland, Ore.

Olsen Mfg. Co., C. A., Elyria, O.

Parker Heating & Manufacturing Co., St. Petersburg, Fla.

Premier Furnace Co., Dowagiac, Mich.

Ryboit Heater Co., Ashland, O.

St. Louis Furnace Mfg. Co., St. Louis.

Schwab Furnace Co., Milwaukee.

Spencer Heater Div., Aviation Corp., Williamsport, Pa.

Stainless & Steel Products Co., St. Paul, Minn.

Stok-A-Fire Co., Inc., University City, Mo.

Stokermatic Co., Salt Lake City, Utah.

Sure Comfort Furnace Co., Berwyn, Ill.

Syncromatic Corporation, Milwaukee.

Twentieth Century Heating & Ventilating Co., Akron, O.

Syncromatic Corporation, Milwaukee,
Twentieth Century Heating & Ventilating Co., Akron, O.
Waterman-Waterbury Co., Minneapolis.
Williamson Heater Co., Cincinnati.
Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, HORIZONTAL

American Foundry & Furnace Co., Bloomington, Ill. American Foundry & Furnace Co., Bloomington American Furnace Co., St. Louis. Andrews Heating Co., Minneapolis. Arcweld Mfg. Co., Inc., Seattle, Wash. Campbell Heating Co., E. K., Kansas City, Mo.

Columbus Heating & Ventilating Co., Columbus, O.

Dravo Corporation, Pittsburgh.
Floral City Co., Monroe, Mich.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.

Majestic Co., Huntington, Ind.
McPherson Furnace & Supply Co., Portland, Ore.
Moncrief Furnace Co., Atlanta, Ga.
Montag Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee.
National Manufacturing & Engineering Co., Detroit.
Northwest Stove & Furnace Works, Portland. Ore.

Northwest Stove & Furnace Works, Portland, Ore. Parker Heating & Manufacturing Co., St. Petersburg, Fla. Parker Heating & Manufacturing Co., St. Petersburg, Fla Ramey Mfg. Co., Columbus, O. Rosebraugh Co., W. W., Salem, Ore. Sandberg Co., H. J., Portland, Ore. Stainless & Steel Products Co., St. Paul, Minn. Twentieth Century Heating & Ventilating Co., Akron, O. Western Blower Co., Saattle, Wash. Western Furnaces, Inc., Tacoma, Wash. XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, CAST IRON

FURNACES, WARM AIR, PIPELESS, CAST IRON

Agricola Furnace Co., Inc., Gadsden, Ala.

American Foundry & Furnace Co., Bloomington, Ill.

American Furnace & Foundry Co., Milan, Mich.

American Radiator & Standard Sanitary Corp., Pittsburgh.

Andes Range & Furnace Corp., Geneva, N. Y.

Barry Furnace Co., Hamilton, O.

Chandler Co., Cedar Rapids, Ia.

Danville Stove & Mfg. Co., Danville, Pa.

Dowagiac Steel Furnace Co., Dowagiac, Mich.

Edwards Furnace Co., Wellsboro, Pa.

Excelsior Steel Furnace Co., Quincy, Ill.

Favorite Manufacturing Co., Piqua, O.

Floyd-Wells Co., Royersford, Pa.

Forest City Foundries Co., Cleveland.

Front Rank Furnace Co., Inc., St. Louis.

Hall-Neal Furnace Co., Indianapolis.

Hart Mfg. Co., Louisville, Ky.

Henry Furnace Co., Holland, Mich.

Home Furnace & Foundry Corp., Coldwater, Mich.

Home Furnace Co., Holland, Mich.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Ideal Furnace Co., Detroit.
Independence Stove & Furnace Co., Independence, Mo.
International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
May-Fiebeger Co., Newark, O.
Meyer Furnace Co., Peorla, Ill.
Montag Stove & Furnace Works, Portland, Ore.

May-Fiebeger Co., Newark, O.
Meyer Furnace Co., Peorla, Ill.
Montag Stove & Furnace Works, Portland, Ore.
Moore Corp., Joliet, Ill.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee.
Olsen Mfg. Co., C. A., Elyria, O.
Orbon Stove Co., Belleville, Ill.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Dowagiac, Mich.
Ravenna Furnace & Heating Co., Ravenna, O.
Robinson Furnace Co., Chicago.
Rudy Furnace Co., Dowagiac, Mich.
Rybolt Heater Co., Ashland, O.
St. Clair Foundry Corp., Centralia, Ill.
St. Louis Furnace Mfg. Co., St. Louis.
Schill Mfg. Co., Crestline, O.
Schwab Furnace Co., Milwaukee.
Sloux City Foundry & Boller Co., Sloux City, Ia.
Spear Stove & Heater Co., James, Philadelphia.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
Thatcher Furnace Co., Garwood, N. J.
Twentieth Century Heating & Ventilating Co., Akron, O.
United States Radiator Corp., Detroit.
Washington Stove Works, Everett, Wash.
Western Furnaces, Inc., Tacoma, Wash.
Westwick & Son, Inc., John, Galena, Ill.
Williamson Heater Co., Cincinnati.
Wise Furnace Co., Akron, O.
XXth Century Heating & Ventilating Co., Akron, O.

Wise Furnace Co., Akron, O. XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, STEEL

• Airtherm Manufacturing Co., St. Louis.
Aladdin Heating Corp., Oakland, Calif.
Andrews Heating Co., Minneapolis.
Areweld Manufacturing Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Campbell Heating Co., Des Moines, Ia.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
• Dowagiac Steel Furnace Co., Dowagiac, Mich.
Grossenbacher Furnace Co., St. Louis.
Hart Mfg. Co., Louisville, Ky.
Hess Warming & Ventilating Co., Chicago.
Home Stove Co., Indianapolis.

Ideal Furnace Co., Detroit.

International Heater Co., Utica, N. Y. Keith Furnace Co., Des Moines, Ia. Kelsey Heating Co., Syracuse, N. Y. Koons Furnace Co., Danville, Ill. Lennox Furnace Co., Marshalltown, Ia. Majestic Furnace Co., Seattle, Wash.

May-Fiebeger Co., Newark, O.

Meyer Furnace Co., Peoria, Ill. Montag Stove & Furnace Works, Portland, Ore. Northwest Stove & Furnace Works, Portland, Or. Nugent Furnaces, Thos., New York City. Orbon Stove Co., Belleville, Ill. Pennsylvania Furnace & Iron Co., Warren, Pa. Pittsburgh Furnace Parts Co., Pittsburgh. Portland, Ore. Pittsburgh Furnace Parts Co., Pittsburgh. Ramey Mfg. Co., Columbus, O.
Rosebraugh Co., W. W., Salem, Ore.
St. Louis Furnace Mfg. Co., St. Louis.
Schwab Furnace Co., Milwaukee.
Stanton Heater Co., Martins Ferry, O.
Stiglitz Furnace & Foundry Co., Louisville, Ky.
Waterman-Waterbury Co., Minneapolis, Minn.
Wise Furnace Co., Akron, O.

FURNACES, WARM AIR, WOOD BURNING, **CAST IRON**

Hart & Crouse Corporation, Utica, N. Y.
Homer Furnace & Foundry Corp., Coldwater, Mich.

International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.

Majestic Co., Huntington, Ind.
Moncreif Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore.

Mueller Furnace Co., L. J., Milwaukee.
Oakland Foundry Co., Belleville, Ill.
Portland Stove Foundry Co., Portland, Me.

Schwab Furnace Co., Milwaukee.
Stainless & Steel Products Co., St. Paul, Minn.
Western Furnaces, Inc., Tacoma, Wash.

FURNACES, WARM AIR, WOOD BURNING, STEEL

American Furnace Co., St. Louis.
Andrews Heating Co., Minneapolis.
Arcweld Manufacturing Co., Inc., Seattle, Wash.
Bovee Furnace Works, Waterloo, Ia.
Campbell Heating Co., Des Moines, Ia.
Campbell Heating Co., E. K., Kansas City, Mo.
Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Grossenbacher Furnace Co., St. Louis.
Hess Warming & Ventilating Co., Chicago.
McPherson Furnace & Supply Co., Portland, Ore. (Also Sawdust)

dust)
Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace & Mfg. Co., Dallas, Tex.
Montag Stove & Furnace Works, Portland, Ore. Montag Stove & Furnace Works, Portland, Ore.
Northwest Stove & Furnace Works, Portland, Ore.
Nugent Furnaces, Thomas, New York City.
Parker Heating & Mfg. Co., St. Petersburg, Fla.
Rosebraugh Co., W. W., Salem, Ore.
Sandberg Co., H. J., Portland, Ore.
Schwab Furnace Co., Milwaukee.
Stainless & Steel Products Co., St. Paul, Minn.
Syncromatic Corporation, Milwaukee.

GAGES, AIR FILTER

Air Filter Engineering Co., Chicago. Defender Automatic Regulator Co., St. Louis.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Hays Corporation, Michigan City, Ind.
Harbusch Composition Signature Control Discovered Herbusch Corporation, Simplex Control Div., St. Louis, Hill, E. Vernon, Chicago. Huyette Co., Inc., Paul B., Philadelphia. Meriam Co., Cleveland. Uehling Instrument Co., Paterson, N. J.

GAS BURNERS See Burners, Gas

GAGES, INDICATING, DRAFT, PORTABLE

Bacharach Industrial Instrument Co., Pittsburgh. Bacharach Industrial Instrument Co., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Defender Automatic Regulator Co., St. Louis.
Detroit Air Conditioning Service Co., Inc., Detroit.
Dwyer Mfg. Co., F. W., Chicago.
Ellison Draft Gage Co., Chicago.
Foxboro Co., Foxboro, Mass.
Hays Corp., Michigan City, Ind.
Hill, E. Vernon, Chicago.
Hotstream Heater Co., The, Cleveland.
Marsh Corporation, Jas. P., Chicago.
Meriam Co., Cleveland.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia.

Preferred Utilities Mfg. Corp., New York City. Scherr Co., Inc., Geo., New York City. Scientific Instrument Co., Detroit. Taylor Instrument Companies, Rochester, N. Y. Uehling Instrument Co., Paterson, N. J. Weaver Mfg. Co., Springfield, Ill.

GATES, BLAST See Blast Gates

GLASS, SAFETY

Libbey-Owens-Ford Glass Co., Toledo, O. Pittsburgh Plate Glass Co., Pittsburgh. Saftee Glass Co., Philadelphia.

GLASS, WIRE, FOR SKYLIGHTS
Atcheson Glass Co., T. J., Buffalo.
Bache & Co., Semon, New York City.
Libbey, Owens, Ford Glass Co., Toledo, O.
Mississipi Glass Co., New York City.
Pennsylvania Wire Glass Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.

GLAZING COMPOUNDS See Compounds, Glazing

GRATES, CONVERSION, SELF-SUPPORTING Albert Lea Foundry, Albert Lea, Minn. Delaware, Lackawanna & Western Coal Co., New York City. Stoket Manufacturing Co., St. Paul, Minn.

GRILLES, HEATING AND VENTILATING

A-J Manufacturing Co., Kansas City. (Stamped Steel)
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York City.
Airo-Fin Grille Co., Detroit.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.

American warming & Ventilating Co., Toledo, C.

Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Best Register Co., Milwaukee.
Central Wire & Iron Works, Des Moines, Ia.
Char-Gale Mfg. Co., Minneapolis.
Crown Iron Works, Minneapolis.
Davies Air Filter Corp., New York City.
Decatur Iron & Steel Co., Decatur, Ala.
Diamond Mfg. Co., Wyoming, Pa.
Eaglesfield Ventilator Co., Indianapolis.
Erdle Perforating Co., Rochester, N. Y.
Gillian Mfg. Co., Detroit.

Harrington & King Perforating Co., Chicago.

Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.

Independent Register Co., Cleveland.
Jamieson Mfg. Co., Dallas, Tex.
Johnston & Chapman Co., Chicago.
Lamneck Products, Inc., Middletown, O.
Lockjoint Wood Products Co., Wichita, Kan. (Wood)
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.

Mueller Furnace Co., L. J., Milwaukee.
Mundt & Sons, Charles, Jersey City, N. J.
Newman Brothers, Inc., Cincinnati.
Register & Grille Mfg. Co., Inc., Brooklyn.
Reliable Perforating Co., Chicago.

Rock Island Register Co., Rock Island, Ill.
Schoedinger, F. O., Columbus, O.
Standard Stamping & Perforating Co., Chicago.
Stewart Manufacturing Corp., Minneapolis.

United States Register Co., Battle Creek, Mich.

Utility Fan Corporation, Los Angeles.
Waterloo Register Co., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago.
Wickwire Spencer Steel Co., New York City.
Wooster Art Wood, Inc., Wooster, O. (Wood)

GRINDERS, BUFFERS, POLISHERS AND SANDERS

GRINDERS, BUFFERS, POLISHERS AND SANDERS See Buffers, Grinders, Polishers and Sanders

GROOVING MACHINES See Machines, Grooving

GUARDS, MACHINERY

Biersach & Niedermeyer Co., Milwaukee.
California Wire Cloth Corporation, Oakland, Calif.
Chicago Metal Mfg. Co., Chicago.

Harrington & King Perforating Co., Chicago.
Littleford Bros., Inc., Cincinnati.

Riester & Thesmacher Co., Cleveland. Southbridge Roofing Co., Inc., Southbridge, Mass. Wickwire Spencer Steel Co., New York City.

GUARDS, SNOW

 Berger Brothers Co., Philadelphia.
 Boyd & Co., Inc., Chas. P., Philadelphia.
 Cartier & Sons Co., M. N., Providence, R. I. • Advertisement in this issue. See Index to Advertisers, page 314.

Chase Brass & Copper Co., Inc., Waterbury, Conn. Danzer Metal Works Co., Hagerstown, Md. Downs-Smith Brass & Copper Co., New York City. Eastern States Supply Co., Brooklyn. Folsom Snow Guard Co., Mills, Mass.

• Hussey & Co., C. G., Pittsburgh. (Copper) Levow, David, New York City. Maysteel Products, Inc., Maysville, Wis. Royal-Apex Mfg. Corp., Brooklyn. (Cast Iron)

GUNS, SPRAY, METALS

Turner Brass Works, Sycamore, Ill.

GUNS, SPRAY, PAINT

Binks Mfg. Co., Chicago.
De Vilbiss Co., Toledo, O.
Eclipse Air Brush Company, Inc., Newark, N. J.
Electric Sprayit Co., Sheboygan, Wis.
Milburn Co., Alexander, Baltimore. Norris Painting & Machinery Corp., Greenwich, Conn. Spray Engineering Co., Somerville, Mass.

GUTTER FORMERS

See Machines, Gutter Forming

GUTTERS

See Eaves Trough and Gutters

HAMMERS, ELECTRIC OR PNEUMATIC

(For closing Pittsburgh locks) See Tools, Metal Workers

HANGERS

See Fittings and Accessories, Eaves Trough and Gutter

HANGERS AND SUPPORTS, PIPE

Packless Metal Products Corp., New Rochelle, N. Y. (Flexible Fasteners for Metal Hose and Tubing)

HARDWARE, FOR CABINETS AND CASINGS

(Handles, name plates, etc.)
American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, American Cabinet Hardware Corp., Rockford, Ill. (Pulls, Knobs, Hinges, Catches, etc.)
American Emblem Co., Utica, N. Y. (Name Plates)
American Insulator Corp., New Freedom, Pa.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Brasco Manufacturing Co., Harvey, Ill.
Crowe Name Plate & Mfg. Co., Chicago.
Dickey-Grabler Co., Cleveland. (Name Plate)
Etched Products Co., Long Island City, N. Y. (Name Plates)
General Etching & Mfg. Co., Chicago. (Name Plates)
Grammes, I. F., & Sons, Inc., Allentown, Pa.
Imperial Molded Products Corp., Chicago. (Plastic Handles, Pulls and Knobs) Pulls and Knobs) Mason & Sons, F. E., Batavia, N. Y. (Name Plates) Metal Marker Co., Cleveland. (Name Plates) National Brass Co., Grand Rapids, Mich. National Lock Co., Rockford, Ill.

Premier Metal Etching Co., Long Island City. (Name Plates)
Soss Manufacturing Co., Detroit. (Invisible Hinges)
Stafford Co., N., Brooklyn, N. Y. (Name Plates)
Stanley Mfg. Co., Dayton, O. (Name Plates)

HEADS

See Fittings and Accessories, Conductor

HEAT TRANSFER SURFACE

See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling Water

HEATERS, CIRCULATING, CABINET TYPE

HEATERS, CIRCULATING, CABINET TYPE

Acme Tin Plate & Roofing Supply Co., Philadelphia. (Electric)

American Stove Có., Lorain Div., Lorain, O. (Oil)

Andrews Heating Co., Minneapolis. (Coal and Oil)

Auburn Burner Co., Auburn, Ind. (Oil)

Bern's Specialty Mfg. Co., Chicago. (Steam)

Cole Hot Blast Mfg. Co., Chicago. (Steam)

Continental Stove Corp., Ironton, O. (Gas)

Dallman Supply Co., Sacramento, Calif. (Gas)

Day & Night Manufacturing Co., Monrovia, Calif. (Gas)

Duo-Therm Div., Motor Wheel Corp., Lansing, Mich. (Oil)

Edwards Mfg. Co., Inc., Cincinnati. (Coal, Coke, Wood)

Enterprise Foundry Co., Belleville, Ill. (Coal and Wood)

Estate Stove Co., Hamilton, O. (Coal, Oil, Gas)

Evanoll Heater Div., Evans Products Co., Detroit. (Oil & Gas)

Excelsior Stove & Mfg. Co., Quincy, Ill.

Florence Stove Co., Garner, Mass. (Oil)

General Gas Light Co., Kalamazoo, Mich.

Heating Equipment Co., San Francisco. (Gas)

Holly Heating & Mfg. Co., South Pasadena, Calif. (Oil)

Independence Stove & Furnace Co., Independence, Mo. (Gas or Coal)

Iron Fireman Manufacturing Co., Cleveland. (Coal, Stoker) Kehm Corporation, Chicago. (Gas and Coal) Laco Oil Burner Co., Griswold, Ia. (Oil) Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)

Lonergan Manufacturing Co., Albion, Mich. (Oli) Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Coal, Gas. Oll and Wood)

Oil and Wood)

Moore Corporation, Joliet, Ill. (Coal, Gas, Oil)
Ohlo Foundry & Mfg. Co., Steubenville, O. (Gas)
Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas)
Payne Furnace & Supply Co., Beverly Hills, Calif.
Perfection Stove Co., Cleveland. (Oil)
Pernot & Rich, Inc., Los Angeles. (Gas)
Pittston Stove Co., Pittston, Pa. (Coal or Wood)
Quaker Mfg. Co., Chicago. (Oil)
Quincy Stove Mfg. Co., Quincy, Ill. (Oil and Coal)
Reznor Mfg. Co., Mercer, Pa. (Gas)
Royal Air Conditioning Equip. Co., Alhambra, Calif. (Gas)
Schoedinger, F. O., Columbus, O.
Silent Glow Oil Burner Corp., Hartford, Conn. (Range Oil)
Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil)
Surface Combustion, Toledo, O. (Gas)
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
Utility Fan Corporation, Los Angeles. (Gas, Butane)
Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N

Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y. (Gas)

Victor Oil Burner Mfg. Co., Hartford, Conn.

Viking Mfg. Corp., Dayton, O. (Oil)

HEATERS, DIRECT FIRED

HEATERS, RADIANT, GAS-FIRED

Day & Night Manufacturing Co., Monravia, Calif. General Gas Light Co., Kalamazoo, Mich. Schoedinger, F. O., Columbus, O.

HEATERS, SCHOOL ROOM

Agricola Furnace Co., Inc., Gadsden, Ala. American Foundry & Furnace Co., Bloomington, Ill. American Furnace & Foundry Co., Milan, Mich. American Radiator and Standard Sanitary Corp., Pittsburgh. American Radiator and Standard Sanitary Corp., Pittsburgh.
Andrews Heating Co., Minneapolis.
Barry Furnace Co., Hamilton, O.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago (Gas or Oil)
Daniels Mfg. Co., Inc., Sam, Hartwick, Vermont. (Wood)
Danville Stove & Mfg. Co., Danville, Pa.

Dowagiac Steel Furnace Co., Dowagiac, Mich.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Green Colonial Furnace Co., Des Moines, Ia.
Hart & Crouse Corporation, Utica, N. Y.
Hart Mfg. Co., Louisville, Ky. (Coal and Gas)
Henry Furnace Company, Medina, Ohlo.

Heating Equipment Co., San Francisco. (Gas)

Henry Furnace Company, Medina, Ohio.
Hess-Snyder Co., Massillon, Ohio.
Home Stove Co., Indianapolis.
Homer Furnace & Foundry Corp., Coldwater, Mich.
International Heater Co., Utica, N. Y.
Keith Furnace Co., Des Moines, Ia.
Kelsey Heating Co., Syracuse, N. Y.
Koons Furnace Co., Danville, Ill.
Little Burner Co., Inc., H. C., San Rafael, Calif. (Oil)
MaGirl Foundry and Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.

May-Fiebeger Co., Newark, Ohio.

Meyer Furnace Co., Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
Moore Corp., Joliet, Ill.

Moncrief Furnace Co., Atlanta, Ga.
Moore Corp., Joliet, Ill.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
National Manufacturing & Engineering Co., Detroit.
Nelson Corporation, Herman, Moline, Ill.
Nesbitt, Inc., John J., Philadelphia.
Orbon Stove Co., Belleville, Ill.
Patten Co., J. V., Sycamore, Ill. (Coal, Oil and Gas)
Payne Furnace & Supply Co., Beverly Hills, Calif.
Perfection Stove Co., Cleveland. (Oil)
Pittston Stove Co., Pittston, Pa.
Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Dowagiac, Mich.

Portland Stove Foundry Co., Portland, Me.
Premier Furnace Co., Dowagiac, Mich.
Reynolds Manufacturing Co., Springfield, Mo.
Reznor Mfg. Co., Mercer, Pa.
Rock Island Stove Co., Rock Island, Ill.
Round Oak Co., Dowagiac, Mich.
Royal Air Conditioning Equip. Co., Alhambra, Calif.
Rudy Furnace Co., Dowagiac, Mich.
St. Clair Foundry Corp., Centralia, Ill.
Sioux City Foundry and Boiler Co., Sloux City, Ia.
Stainless & Steel Products Co., Saint Paul, Minn.
Syncromatic Corporation, Milwaukee.
Tennessee Enamel Mfg. Co., Nashville, Tenn. (Gas)
Twentieth Century Heating & Ventilating Co., Akron, O.
Vacuum Gas Appliance Div., Union Fork & Hoe Co., Rome, N. Y.
Waterman-Waterbury Co., Minneapolis, Minn. (Coal, Oil and Wood)

Wood)
Western Blower Co., Seattle, Wash.

Williamson Heater Co., Seattle, Wash.

Wise Furnace Co., Akron, O.

XXth Century Heating & Ventilating Co., Akron, O.

HEATERS, WATER, OIL-FIRED

Airtempt Division, Chrysler Corporation, Dayton, Ohio. Aldrich Company, Wyoming, Ill.

Aldrich Company, Wyoming, Ill.

Anchor Post Fence Co., Heating Div., Baltimore.

Auburn Burner Company, Auburn, Ind.

Automatic Burner Corporation, Chicago.

Automatic Humidifier Co., Cedar Falls, Iowa.

Century Engineering Corporation, Cedar Rapids, Iowa.

Cleveland Steel Products Corp., Torridheet Div., Cleveland.

Dahlquist Mfg. Co., Inc., Somerville, Mass.

Day & Night Manufacturing Co., Monrovia, Calif.

Delco Appliance Div. General Motors Corp., Rochester, N. Y.

Day & Night Manufacturing Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corporation, Lansing, Mich.
Electrol Mfg. Co., Passaic, N. J.
Essick Manufacturing Company, Los Angeles.
Florence Stove Co., Gardner, Mass.
Gerstein & Cooper Co., South Boston, Mass.
Gillen Company, J. L., Dowagiac, Mich.
Johnson Co., S. T., Oakland, Cal.
Kleen-Heet, Inc., Chicago.
Lonergan Manufacturing Co., Albion, Mich.
Michigan Tank & Furnace Corp., Lochinvar Products Div., Detroit. (Multiple Stage)
National Airoll Burner Co., Inc., Philadelphia.

Michigan Tank & Furnace Corp., Lochinvar Products Div., Detroit. (Multiple Stage)
National Airoil Burner Co., Inc., Philadelphia.
Nu-Way Corp., Rock Island, Ill.
Ohio Foundry & Mfg. Co., Steubenville, Ohio.
Pacific Steel Boller Div., United States Radiator Corp., Detroit.
Pan-American Engineering Company, Berkeley, Calif.

Penn Boller & Burner Mfg. Corp., Lancaster, Pa.
Perfection Stove Co., Inc., Cleveland.
Petroleum Heat & Power Co., Stamford, Conn.
Preferred Utilities Mfg. Corp., New York City.
Quaker Manufacturing Co., Chicago.

Quincy Stove Mfg. Co., Quincy, Ill.
Ray Oil Burner Company, San Francisco.
Reif-Rexoil, Inc., Buffalo.
Scott-Newcomb, Inc., St. Louls.
Taco Heaters, Inc., New York City.
Timken Silent Automatic Div., Timken-Detroit Axle Co., Detroit.
United States Radiator Corporation, Detroit.

Viking Mfg. Corp., Dayton, Ohio.

Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

York-Heat Div., York-Shipley, Inc., York, Pa.

HEATERS, WATER, STOKER-FIRED

Catskill Metal Works, Inc., Catskill, N. Y.

Gehl Bros, Mfg. Co., West Bend, Wis.
Pan-American Engineering Company, Berkeley, Calif.

Schwitzer-Cummins Co., Indianapolis.
Stokermatic Company, Sali Lake City, Utah.

HEATERS, WATER, STORAGE, GAS

American Radiator & Standard Sanitary Corp., Pittsburgh. American Radiator & Standard Sanitary Corp., Proceedings of the Crane Company, Chicago. Dahlquist Mfg. Co., Inc., Somerville, Mass. Day & Night Manufacturing Co., Monrovia, Calif. Handley Brown Heater Co., Jackson, Mich. Mission Water Heater Co., Los Angeles. Schoedinger, F. O., Columbus, Ohio. Pan American Engineering Co., Berkeley, Calif. Security Manufacturing Co., Kansas City.

HEATING COILS See Coils, Heating

HOSE, METAL, FOR ELIMINATING COMPRESSOR VIBRATION

American Metal Hose Branch, American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York City.
Chicago Metal Hose Corporation, Maywood, Ill.
Ecilpse Aviation, Div., Bendix Aviation Corp., Bendix, N. J.
Packless Metal Products Corp., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.
Seamlex Co., Long Island City, N. Y.
Titeflex Metal Hose Co., Newark.
United Metal Hose Co., Inc., Long Island City, N. Y.

HOUSINGS, BLOWER

Air Controls, Inc., Cleveland.

Air Controls, Inc., Cleveland.

Brundage Co., Kalamazoo, Mich.
Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, Ohio.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Stamping Co., Detroit.
Economy Electric Mfg. Co., Cicero, Ili.
General Blower Corp., San Francisco.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Lau Blower Co., Dayton, O.
National Manufacturing & Engineering Co., Detroit.
Royal Air Conditioning Equipment Co., Albambra, Cal.

National Manufacturing & Engineering Co., Detroit.
Royal Air Conditioning Equipment Co., Alhambra, Cal.
Sandberg Co., H. J., Portland, Ore.
Schwitzer-Cummins Co., Indianapolis.
Sturtevant Co., B. F., Hyde Park, Boston.
Torrington Mfg. Co., Torrington, Conn.
U. S. Air Conditioning Corp., Minneapolis.
Viking Air Conditioning Corp., Cleveland.

HOUSINGS, FAN, PROPELLER

Commercial Shearing & Stamping Co., Youngstown, Ohio, (Venturi type) Dahlstrom Metallic Door Co., Jamestown, N. Y.

HUMIDIFIER FITTINGS

See Fittings, Humidifier, Water Line

HUMIDIFIER VALVES See Valves, Humidifier, Water Level

HUMIDIFIERS, FURNACE, EVAPORATION, **AUTOMATIC**

AUTOMATIC

Agricola Furnace Co., Inc., Gadsden, Ala.
American Air Conditioning Co., Minneapolis.

• Automatic Humidifler Co., Cedar Falls, Ia.
Badger Mfg. & Sales Co., Milwaukee.
Barclay, Inc., Robert, Chicago.
Bard Manufacturing Company, Bryan, Ohio.
Betz Engineering Co., Kansas City.
Cary Mfg. Co., Waupaca, Wis.
Chandler Co., Cedar Rapids, Ia.

• Des Moines Stove Repair Co., Des Moines, Ia.
Glasby Manufacturing Company, Inc., J. P., Bloomfield, N. J.
Green Colonial Furnace Co., Des Moines, Ia.

• Hall-Neal Furnace Co., Indianapolis.
Ideal Furnace Co., Indianapolis.
Ideal Furnace Co., Sioux City, Ia.
Kraker, Henry, Holland, Mich.
Little Burner Co., Inc., H. C., San Rafael, Calif.

• McDonnell & Miller, Chicago.
Maid-O'-Mist, Inc., Chicago.
Marshall Furnace Co., Marshall, Mich.

• Mayflower Air-Conditioners, Inc., St. Paul.

Marshall Furnace Co., Marshall, Mich.

Mayflower Air-Conditioners, Inc., St. Paul.

Meyer Furnace Co., Peoria, Ill.
Monmouth Products Co., Cleveland, O.

Mueller Furnaces, Thomas, New York City.

Olsen Manufacturing Co., C. A., Elyria, Ohio.
Patten Co., J. V., Sycamore, Ill.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pfening Co., Fred D., Columbus, Ohio.

Premier Furnace Co., Dowagiac, Mich.

Round Oak Co., Dowagiac, Mich.

Rudy Furnace Co., Dowagiac, Mich.

Sloux City Foundry and Boiler Co., Sioux City, Ia.
Skilbeck Mfg. Co., Kenosha, Wis.
Skuttle Manufacturing Co., Detroit.
Somers, Inc., H. J., Detroit, Mich.
Thatcher Furnace Co., Garwood, N. J.

Viking Air Conditioning Corp., Cleveland.
Western Blower Co., Seattle, Wash.

Wise Furnace Co., Akron, O.

HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

Air Controls, Inc., Cleveland.

American Foundry & Furnace Co., Bloomington, Ill.

American Radiator and Standard Sanitary Corp., Pittsburgh.

American Radiator and Standard Sanitary Corp., Binks Mfg. Co., Chicago. Bishop & Babcock Mfg. Co., Cleveland. Chelsea Fan & Blower Co., Inc., Irvington, N. J. Electric Sprayit Company, Shèboygan, Wis. Handelan Washed Air Co., Minneapolis. Hubbard Company, Minneapolis.

Hubbard Company, Minneapolis.
Mayflower Air-Conditioners, Inc., St. Paul.
Meyer Furnace Co., Peoria, Ill.
Somers, Inc., H. J., Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Company, Chicago.
Supreme Electric Products Corp., Rochester, N. Y.
Thatcher Furnace Co., Garwood, N. J.

HUMIDIFIERS, UNIT, ROOM TYPE (Without Heating)

HUMIDIFIERS, UNIT, ROOM TYPE (Without Heat Bahnson Co., Winston-Salem, N. C. Comfort Products Corporation, Harvey, Ill. Fairbanks, Morse & Co., Chicago.
General Air Conditioning Corp., Cincinnati. Handelan Washed Air Co., Minneapolis. Kauffman Air Conditioning Corp., St. Louis. Lion Mfg. Corp., Chicago.
Lohman, Inc., Wm. J., Irvington, N. J.
Lowell Air Conditioning Corp., Philadelphia.

Marley Company, Kansas City, Kansas.
Norwood Filtration Co., The, Florence, Mass.
Pfening Company, Fred D., Columbus, Ohio. (Industrial) Skilbeck Mfg. Co., Kenosha, Wis.
Somers, Inc., H. J. Detroit.
Spray-Wheel Air Conditioners, Inc., Denver, Colo. Standard Engineering Works, Pawtucket, R. I.
Steamair Co., Cincinnati, Ohio.

U. S. Air Conditioning Corp., Minneapolis.

HUMIDISTATS

American Moistening Co., Providence, R. I. Au-Temp-Co., Corp., New York City. Bahnson Co., Winston-Salem, N. C. Barber-Colman Co., Rockford, Ill. Bristol Co., Waterbury, Conn.

• Advertisement in this issue. See Index to Advertisers, page 314.

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Am Bris to Fee Fox Frie G. I H. Hill Joh Lee Moe Pal Par Scie

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Inter John Keas

AMERI

Detroit Lubricator Co., Detroit, Mich.
Friez Instrument Division, Towson, Md. (Human Hair)
H-B Instrument Co., Inc., Philadelphia, Pa.
Johnson Service Co., Milwaukee, Wis. (Wood, Hair, Membrane)
Minneapolis-Honeywell Regulator Co., Minneapolis (Human

hair) Parks-Cramer Co., Fitchburg, Mass.

Penn Electric Switch Co., Goshen, Ind.
Powers Regulator Co., Chicago.
Standard Engineering Works, Pawtucket, R. I.
Tagliabue Mfg. Co., C. J., Brooklyn. White-Rodgers Electric Co., St. Louis

HUMIDITY CONTROLS

See Humidistats

HUMIDITY RECORDERS

See Recorders, Humidity

HYGROMETERS

American Moistening Co., Providence, R. I.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia.
Fee and Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
H. B. Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
International Moistening Co., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia. (Recording)
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Co., Cincinnati.
Parks-Cramer Co., Flitchburg, Mass.
Precision Thermometer and Instrument Co., Philadelphia.
Scientific Instrument Co., Detroit.
Standard Thermometer, Inc., Boston.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
Weksler Thermometer Corp., New York City. American Moistening Co., Providence, R. I.

INDICATORS, SOUND LEVEL

General Electric Co., Schenectady, N. Y.

INSULATING CEMENT

See Cement, Insulating

INSULATING WINDOWS, HEAT See Windows, Heat Insulating

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago. (Rockwool)
Air-O-Cell Industries, Inc., Detroit.
Alfol Insulation Co., Inc., New York City. (Blanket)
Alton Mineral Wool Insulation Co., Alton, Ill.
Aluminum Company of America, Pittsburgh. (Reflective foil)
American Flange & Mfg. Co., Inc., New York City. (Metal American Hair & Felt Co., Chicago. (Hair)
Armstrong Cork Co., Lancaster, Pa. (Cork)
Bache & Co., Semon, New York City. (Glass)
Baldwin-Hill Co., Trenton, N. J. (Rockwool)
Barrett Division, Allied Chemical & Die Corporation, New York City, (Tar felt and rockwool)

Berry Jr. & Co., Inc., F. E., Everett, Mass.

Blocksom & Company, Michigan City, Ind.

Cabot, Inc., Samuel, Boston.

Carey Co., Philip, Lockland, Cincinnati, O. (Rockwool)

Carney Rockwool Co., Mankato, Minn. (Granulated, Loose, and Celotex Corp., Chicago.
Chamberlin Metal Weather Strip Co., Detroit. (Rock wool)
Coast Insulating Corp., Los Angeles. (Rockwool Batts, Fill)
Cork Import Corp., New York City. (Corkboard) (Mineral Wool Board) Cork Insulation Co., New York City. (Cork)
Doheny Co., John J., Belmont, Mass. (Blanket)
Dry-Zero Corporation, Chicago, (Blanket and Bound Batt)
Eagle-Picher Lead Co., Cincinnati, O. (Mineral wool)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fir-Tex Insulating Board Co., St. Helens, Ore. (Wood fibre-

Finitkote Co., New York City. (Fibre board and rockwool)
Ford Roofing Products Co., Chicago. (Board and rockwool)
General Insulating Products Co., Brooklyn, N. Y.
Hinde & Dauch Paper Co., Sandusky, O. (Air-Cell)
Insul-Wool Insulation Corp., Wichita, Kansas.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.
(Wood fibre)

(Wood fibre)
International Vermiculite Co., Springfield, Ill. (Loose fill)
Jiffy Manufacturing Co., Hillside, N. J. (Blanket)
Johns-Manville, New York City. (Rock wool, fibre board)
Johnston Tin Foll & Metal Co., St. Louis. (Paper backed foil)
Keasbey Co., Robert A., New York City. (Rock wool)
Keasbey & Mattison Co., Ambler, Pa.

Kennedy, Inc., David E., Brooklyn, N. Y. (Board)
Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
Ludowici-Celadon Co., Chicago. (Wool)
Marblehead Lime Co., Chicago. (Rock wool)
Masonite Corp., Chicago, Ill. (Sheathing, Lath, Tile, Plank,
Blanket, Finish Panels) Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool) Mitchell & Smith, Inc., Mineral Felt Div., Detroit. (Cork, Rock Multi-Cell Sales Corp., Minneapolis (Quilted Newspaper Blanket)

Mundet Cork Corp., Brooklyn, N. Y. (Cork)
Munn and Steele, Inc., Newark, N. J. (Vermiculite)
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis (Vermiculite)

Owens-Corning Fiberglas Corporation, Toledo. ((Board and Blanket)

Pacific Lumber Co., San Francisco. (Loose fill)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco.
Plastergon Wall Board Co., Buffalo. (Mineral Wool and Rigid

Poe Co., C. W., Cleveland. (Mineral Wool)
Refractory & Insulation Corp., New York City. (Mineral wool, loose granulated) Reynolds Metals Co., Richmond, Va. (Reflective)
Riverton Lime & Stone Co., Inc., Riverton, Va. (Mineral Wool)
Robinson Insulation Co., Great Falls, Mont. (Loose Fill)
Rock Fleece Co., El Paso, Texas. (Fill)
Ruberoid Co., New York City. (Rock Wool)
Samson Plaster Board Co., Buffalo. (Fill, batts, blankets, foll, board)

board)
Silvercote Products, Inc., Chicago. (Reflective fabric)
Specialty Converters, Inc., East Braintree, Mass. (Reflective)
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago. (Asbestos, hair-felt)
Standard Lime & Stone Co., Baltimore, Md. (Rock wool)
Standard Rolling Mills, Incorporated. Brooklyn. (Reflective)
Tennessee Products Corp., Nashville, Tenn. (Mineral Wool)
Therminsul Corp. of America, Kalamazoo, Mich. (Batts, bulk, granulated) granulated)

Truscon Steel Co., Youngstown, O. (Board between metal sheets)

Union Rock Wool Corp., Wabash, Ind. (all types)
United Cork Companies, Kearney, N. J.
United States Gypsum Co., Chicago, Ill. (Wool and board)
United States Mineral Wool Co., Chicago. (Rock wool)
U. S. Rock Wool Co., Salt Lake City. (Granulated, Batt and Blanket)

Universal Gypsum & Lime Co., Chicago. (Loose fill)
Universal Zonolite Insulation Co., Chicago. (Loose Fill, Plaster)
Waukesha Lime & Stone Co., Waukesha, Wis. (Rock Wool batts and bulk)

western Mineral Products Co., Omaha, Nebr. (Fill)
Western Rock Wool Corp., Huntington, Ind. (Fill)
Wilson & Co., Inc., Chicago, Ill. (Flexible, Blanket, Board)
Wilson, Inc., Grant, Chicago, Ill. (Rock Wool)
Wood Conversion Co., St. Paul, Minn. (Board and blanket)

INSULATION, DUCT, SOUND DEADENING

American Hair & Felt Co., Chicago, Ill. (Hair Felt)
Baldwin-Hill Company, Trenton, N. J. (Rockwool, block)
Barrett Division, Allied Chemical & Die Corporation, New York.
Berry, Jr., & Co., Inc., F. E., Everett, Mass.
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Ohio.
Celotex Corp., Chicago.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Co., Inc., Boston.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.
Johns-Manville, New York
Keasbey Co., Robert A., New York.
Kimberly-Clark Corp., Neenah, Wis.
Mortell Co., J. W., Kankakee, Ill. (Adhesive)
Owens-Corning Fiberglas Corporation, Toledo. (Board and Blanket)

Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco.
Reynolds Metals Co., Richmond, Va. Robinson Insulation Co., Great Falls, Mont.
Telsit Insulation Co., Great Falls, Mont.
Telsit Insulation Co., Bronx, N. Y. (Plastic)
Universal Zonolite Insulation Co., Chicago. (Cement)
Western Felt Works, Chicago.
Western Silicair Products, Inc., Burbank, Cal.

Wilson, Inc., Grant, Chicago.

INSULATION, DUCT, THERMAL

Acme Asbestos Covering & Flooring Co., Chicago.
Air-O-Cel Industries, Inc., Detroit.
Alfol Insulation Co., Inc., New York City. (Aluminum foil)
American Flange & Mfg. Co. Inc., New York.
American Hair & Felt Co., Chicago.
Armstrong Cork Co., Lancaster, Pa.
Baldwin-Hill Co., Trenton, N. J. (Blanket)
Barrett Division, Allied Chemical & Die Corporation, New York
City. (Rock Wool)
Berry Jr. & Co., Inc., F. E. Everett, Mass.
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, Ohio.

Celotex Corp., Chicago.
Cork Import Corp., New York City. (Corkboard)
Cork Insulation Co., Inc., New York City. (Cork)
Dry-Zero Corporation, Chicago. Lead Co., Cincinnati, O. (Mineral wool, block, Eagle-Picher blanket) Ehret Magnesia Mfg. Co., Valley Forge, Pa. Enret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Co., Inc., Boston.
Fir-Tex Insulating Board Co., St. Helens, Ore.
General Insulating Products Co., Brooklyn.
Goodrich Company, B. F., Akron, Ohio.
Hinde & Dauch Paper Co., Sandusky, Ohio.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis.
International Vermiculite Co., Springfield, Ill. (Block)
Johns-Manville, New York City.
Keasbey Co., Robert A., New York City.
Keasbey & Mattison Co., Ambler, Pa. (85% Magnesia—Pipe, and Blocks)

Keasbey & Mattison Co., Ambler, Pa. (85% Magnesia—Pipe, and Blocks)
Kennedy, Inc., David E., Brooklyn. (Cork)
Keystone Asphalt Products Co., Chicago.
Kimberly-Clark Corp., Neenah, Wis. (Expanding Blanket)
Masonite Corporation, Chicago Ridge, Ill. (Rock wool)
Mitchell & Smith, Inc., Mineral Felt Div., Detroit. (Cork)
Mundet Cork Corp., Brooklyn. (Cork)
Mundet Cork Corp., Brooklyn. (Cork)
Mund Gypsum Co., Buffalo.
National Gypsum Co., Buffalo.
Nelson Mfg. Co., B. F., Minneapolis.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Owens-Corning Fiberglas Corp., Toledo. (Board and Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco.
Poe Co., C. W., Cleveland.
Quigley Co., Inc., New York City. (Inside Duct Lining).

Refractory & Insulation Corp., New York City. (Inside Duct Lining).
Reynolds Metals Co., Richmond, Va.
Rebinson Insulation Co., Great Falls, Mont.
Ruberold Co., New York City. (Cellular).
Sall Mountain Co., Chicago.
Schundler & Co., Inc., F. E., Joliet, Ill.
Smith & Kanzler Corp., Elizabeth, N. J. (Asbestos Air Cell)
Sprayo-Flake Co., Chicago.
Standard Asbestos Mfg. Co., Chicago.
Telsit Insulation Co., Bronx, New York City.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United States Mineral Wool Co., Chicago. (Rockwool)
Universal Zonolite Insulation Co., Chicago. (Cement and Blocks)
Western Felt Works, Chicago. Western Felt Works, Chicago. (Cement & Western Felt Works, Chicago. (Flexible, fire resisting) Wilson, Inc., Grant, Chicago. (Wood Conversion Co., St. Paul, Minn.

INSULATION, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago.
Alfol Insulation Co., Inc., New York City.
Baldwin-Hill Co., Trenton, N. J. (Asbestos cement)

Carey Co., Philip, Lockland, Ohio.
Coast Insulating Corp., Los Angeles. (Rock Wool Cement)
Eagle-Picher Lead Co., Cincinnati, O. (Blocks)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Green Fire Brick Co., A. P., Mexico, Mo. (Vermiculite)
International Vermiculite Co., Springfield, Ill. (Block-Cement)
Johns-Mapyille. New York City. (85% Magnesia). Johns-Manville, New York City. (85% Magnesia).

Keasbey Co., Robert A., New York (Asbestos)

Krehbiel Co., J. H., Chicago. (Boiler and Breech Covering)

Ludowici-Celadon Co., Chicago. (Fire Brick)

Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)

Mitchell & Smith, Inc., Mineral Felt Div., Detroit. (Rock Wool,

Blocks)
Munn and Steele, Inc., Newark, N. J. (Bonding)
Nelson Mfg. Co., B. F., Minneapolis.
Norristown, Magnesia & Asbestos Co., Norristown, Pa.
Ownes-Corning Fiberglas Corp., Toledo, O. (Blanket)
Pacific States Felt & Mfg. Co., Inc., San Francisco.
Plant Rubber & Asbestos Works, Inc., San Francisco. (Asbestos)
Quigley Company, Inc., New York City.
Refractory & Insulation Corp., New York City. (Block Blanket).
Robinson Insulation Co., Great Falls, Mont. (High Temperature Cement)

Cement)
Ruberoid Co., New York City. (Blocks, Asbestos Cement).
Schundler & Co., Inc., F. E., Joliet, Ill.
Smidth & Co., F. L., New York City.
Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.
Telsit Insulation Co., Bronx, N. Y.
Therminsul Corp., Kalamazoo, Mich. (Block rock wool)
United States Mineral Wool Co., Chicago.
Universal Zonolite Insulation Co., Chicago. (Cement, Bricks and Blocks)

· Wilson, Inc., Grant, Chicago,

KITCHEN FANS See Fans, Kitchen

LACQUERS

See Enamels and Lacquers

LEADER STRAPS

See Fittings and Accessories, Conductor

LIFTS, SKYLIGHT

LIFIS, SKYLIGHT

Biersach & Niedermeyer Company, Milwaukee.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Danzer Metal Works Co., Hagerstown, Md.
Dayton Greenhouse Mfg. Co., Dayton, Ohio.
Levow, David, New York City. (Gearing)
Main Cornice Works, Los Angeles.
Park City Cornice Works, Inc., Bridgeport, Conn.
Royal-Apex Mfg. Corp., Brooklyn.
Schoedinger, F. O., Columbus, Ohio.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Van Noorden Co., E., Boston.
Vent-O-Lite Co., Chicago.
Weiss & Co., H., New York City.

LOUVRES AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Air Conditioning Products Co., Detroit.
Air Control Products, Inc., Coopersville, Mich.
Air Controls, Inc., Cleveland.
Air Conditioning Products Co., Detroit.
Airecon Industries Incorporated, Detroit.
Airmaster Corp., Chicago.
Allen Corp. Detroit.

Alreach mustries incorporated, Detroit.

Alreach Corp., Chicago.

Allen Corp., Detroit.

American Coolair Corp., Jacksonville, Fla.

American Foundry & Furnace Co., Bloomington, Ill.

American Warming & Ventilating Co., Toledo, Ohio.

Ames Co., W. R., San Francisco.

Arex Co., Chicago.

Barber-Coleman Company, Rockford, Ill.

Belanger Fan & Blower Co., Detroit.

Belco Exhaust Fan Mfg. Co., St. Louis.

Biersach & Niedermeyer Co., Milwaukee.

Bishop & Babcock Mfg. Co., Cleveland.

Buffalo Forge Co., Buffalo.

Burt Mfg. Co., Akron, Ohio.

Campbell Heating Co., E. K., Kansas City, Mo.

Champion Blower & Forge Co., Lancaster, Pa.

Chelsea Fan & Blower Co., Inc., Irvington, N. J.

Chicago Metal Mfg. Co., Chicago.

Circulators & Devices Mfg. Corp., New York City. (Automatic and Manual)

and Manual)

Circulators & Devices Mfg. Corp., New York City. (Automatic and Manual)

Clay Equipment Corp., Cedar Falls, Ia.

Decatur Iron & Steel Co., Decatur, Ala.

Dual-Air Fan Corporation, Chicago.

Economy Electric Manufacturing Co., Cicero, Ill.

Electrovent Fan & Mfg. Co., Detroit.

Gillian Mfg. Co., Detroit.

Gillian Mfg. Co., Detroit.

Gulth Co., Edwin F., St. Louis.

Hirschman Co., Inc., W. F., Buffalo.

International Engineering, Inc., Dayton, Ohio.

International Steel Company, Evansville, Ind.

Jamieson Mfg. Co., Dallas, Tex.

Johnson Fan & Blower Corp., Chicago.

Johnston Co., Wm. W., Dayton, Ohio.

Jordan & Co., Paul R., Indianapolis.

Kelvin-White Co., Boston.

King Ventilating Co., Owatonna, Minn.

Kirk & Blum Mfg. Co., Cincinnati.

Lau Blower Co., Dayton, O.

Leslie Welding Co., Chicago.

Lockjoint Wood Products Co., Wichita, Kan. (Wood; stationary door, wall, window and celling)

Lohman, Inc., William J., Irvington, N. J.

Maysteel Products, Inc., Mayville, Wis.

Meier Electric & Machine Co., Indianapolis.

Meyer Mfg. Co., Detroit.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Myers Electric Co., Pittsburgh.

Nelson Corporation, Herman, Moline, Ill.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Myers Electric Co., Pittsburgh.
Nelson Corporation, Herman, Moline, Ill.
Peerless Electric Co., Warren, Ohlo.
Reed Unit-Fans, Inc., New Orleans.
Richmond Fireproof Door Company, Richmond, Ind.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H. Pittsburgh.
Schoedinger, F. O., Columbus, Ohlo.
Signal Electric Mfg. Co., Menominee, Mich.
Standard Stamping & Perforating Co., Chicago.
Sturtevant Co., B. F., Hyde Park, Boston.
Supreme Heater & Ventilating Corp., St. Louis.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Utility Fan Corporation, Los Angeles.
Van Noorden Co., E., Boston.

Van Noorden Co., E., Boston. Victor Electric Products, Inc., Cincinnati. Waterloo Register Co., Waterloo, Ia.

MACHINERY, REBUILT AND USED

Biggs Supply Co., B. C., Lincoln, Nebr. Brooks Co., Inc., B. R., Boston 10.

Central-West Machinery Co., Chicago.

General Blower Co., Chicago.

- Hyman & Sons, Joseph, Philadelphia.

 Interstate Machinery Co., Inc., Chicago.
 Maplewood Machinery Co., Chicago.
 Osborn Co., J. M. & L. A., Cleveland.
 St. Louis Tool Co., St. Louis.
 - MACHINES, BAR FOLDERS, HAND

- Barth Mfg. Co., Plantsville, Conn.
 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn. St. Louis Tool Co., St. Louis.

MACHINES, BAR FOLDERS, POWER

- Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, BEADING, HAND

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- Barth Mfg. Co., Plantsville, Conn.
 Niagara Machine & Tool Works, Buffalo.
 Packham Crimper Co., Mechanicsburg, Ohio.
 Peck, Stow & Wilcox Co., Southington, Conn.
 Robertson, F. L., Buffalo.

MACHINES, BEADING, POWER

- Callahan Can Machine Co., Inc., Brooklyn.
 Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.
 Swain Mfg. Co., Fred J., St. Louis.

 Whiting Corp., Quickwork Div., Harvey, Ill.
 Yoder Company, Cleveland.

MACHINES, BURRING, HAND

- Barth Mfg. Co., Plantsville, Conn.
 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, BURRING, POWER

- Cincinnati Electrical Tool Co., The, Cincinnati.

 Independent Pneumatic Tool Co., Chicago.
 Maplewood Machinery Co., Chicago.
 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.
 Stow Mfg. Co., Binghamton, N. Y.

MACHINES, CLEAT BENDING, HAND

Smith, R. E., Waukegan, Ill.

MACHINES, COMBINATION, HAND

(Beading, Burning, Turning, Wiring, etc.)

- Barth Mfg. Co., Plantsville, Conn.
 Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.
 Packham Crimper Co., Mechanicsburg, Ohio. (Beading—Rotary)
- Snips)
 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, COMBINATION, POWER

(Beading, Burring, Turning, Wiring, etc.)

- Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.
 Whiting Corp., Quickwork Div., Harvey, Ill.
 Wysong & Miles Co., Greensboro, N. C.

MACHINES, CRIMPING, HAND

- Barth Mfg. Co., Plantsville, Conn.
 C-B Tool Co., Lancaster, Pa.
 Niagara Machine & Tool Works, Buffalo.
 Packham Crimper Co., Mechanicsburg, Ohio.
 Peck, Stow & Wilcox Co., Southington, Conn.
 Service Machine Co., Elizabeth, N. J.

MACHINES, CRIMPING, POWER

- Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, DOUBLE SEAMER, ROOF, POWER

- Maxfield Manufacturing Co., Temple, Tex.

 Niagara Machine & Tool Works, Buffalo.

MACHINES, ELBOW, HAND

- Barth Mfg. Co., Plantsville, Conn.
 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, ELBOW, POWER

- Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, FLANGING, HAND

- Barth Mfg. Co., Plantsville, Conn.

 Lockformer Co., Chicago.
 Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.
 "Original" Metal Flanging Machine Works, Seattle, Wash.
 Packham Crimper Co., Mechanicsburg, Ohio.

 Peck, Stow & Wilcox Co., Southington, Conn.
 Ward Machinery Co., Chicago.
 Weiss & Co., H., New York.

MACHINES, FILING

Continental Machines, Incorporated, Minneapolis.

MACHINES, FLANGING, POWER

- Bittner Engineering Co., New York.
 Call han Can Machine Co., Inc., Brooklyn.
 Cleveland Punch & Shear Works Co., Cleveland.
 Engineering and Research Corporation, Riverdale, Md.
 Lockformer Co., Chicago.
 Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.
 Riverside Machinery Company, Chicago.
 Swain Mfg. Co., Fred J., St. Louis.
 Whiting Corp., Quickwork Div., Harvey, Ill.

MACHINES, GROOVING, HAND

- Barth Mfg. Co., Plantsville, Conn.
 Nlagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, GROOVING, POWER

- Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, GUTTER FORMING, HAND

Robertson, F. L., Buffalo.

MACHINES, NIBBLING, HAND

National Machine Tool Co., Racine, Wis.

MACHINES, NIBBLING, POWER

- Campbell, Andrew C., Div. of American Chain & Cable Co., Inc., Bridgeport, Conn.
- Independent Pneumatic Tool Cb., Chicago. (Portable)
 Libert Machine Co., Green Bay, Wis.
 St. Louis Tool Co., St. Louis.
 Savage Co., W. J., Knoxville, Tenn.
 Service Machine Co., Elizabeth, N. J.

MACHINES, PIPE, LOCK FORMING, POWER

- Lockformer Co., Chicago.
 Maplewood Machinery Co., Chicago.

MACHINES, PITTSBURGH LOCK FORMING

 Lockformer Co., Chicago, Maplewood Machinery Co., Chicago Rafter Machine Co., Belleville, N. J. Chicago.

MACHINES, PITTSBURGH LOCK OPENERS

Atlas Machine & Tool Co., Portland, Ore. Maplewood Machinery Co., Chicago.

MACHINES, ROLLING, CRIMPING, BEADING, POWER

- Maplewood Machinery Co., Chicago.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SEAMING, HAND

- Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn. Weiss & Co., H., New York.

MACHINES, SEAMING, POWER

- Callahan Can Machine Co., Inc., Brooklyn.

Lockformer Co., Chicago. Maplewood Machinery Co., Chicago. Niagara Machine & Tool Works, Buffalo. Peck, Stow & Wilcox Co., Southington, Conn. Swain Mfg. Co., Fred J., St. Louis.

- MACHINES, SETTING DOWN, HAND
- Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.

- MACHINES, SETTING DOWN, POWER
- Callahan Can Machine Co., Inc., Brooklyn.

 Niagara Machine & Tool Works, Buffalo.

 Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SHEET METAL SHRINKING, POWER

Engineering and Research Corporation, Riverdale, Md.

MACHINES, SLIP ROLL FORMING, HAND

Barth Mfg. Co., Plantsville, Conn.
Bertsch & Co., Cambridge City, Ind.
Hendley & Whittemore Co., Beloit, Wis.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SLIP ROLL FORMING, POWER

Bertsch & Co., Cambridge City, Ind. Hendley & Whittemore Co., Beloit, Wis. Maplewood Machinery Co., Chicago. Niagara Machine & Tool Works, Buffalo.

• Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, SLITTING, HAND

Barth Mfg. Co., Plantsville, Conn.
Bertsch & Co., Cambridge City, Ind.
 Beverly Shear Co., Chicago.
Buffalo Forge Co., Buffalo.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Believille, N. J.
Service Machine Co., Elizabeth, N. J.
Ward Machinery Co., Chicago.

 Whitney Metal Tool Co., Rockford, Ill.

MACHINES, SLITTING, POWER

Bertsch & Co., Cambridge City, Ind.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Hendley & Whittemore Co., Beloit, Wis.
Libert Machine Co., Green Bay, Wis. (Rotary)
Maplewood Machinery Co., Chicago.

Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Rafter Machine Co., Belleville, N. J.
St. Louis Tool Co., St. Louis.

Whiting Corp., Quickwork Div., Harvey, Ill.
Yoder Co., Cleveland.

MACHINES, SQUARING, POWER

Bertsch & Co., Cambridge City, Ind.

• Peck, Stow & Wilcox Co., Southington, Conn.

• Whitney Metal Tool Company, Rockford, Ill. (Shear)

MACHINES, WIRING, HAND

Barth Mfg. Co., Plantsville, Conn.
Maplewood Machinery Co., Chicago.
Niagara Machine & Tool Works, Buffalo.

· Peck, Stow & Wilcox Co., Southington, Conn.

MACHINES, WIRING, POWER

Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works, Co., Cleveland.
Maplewood Machinery Co., Chicago.

Niagara Machine & Tool Works, Buffalo.

Peck, Stow & Wilcox Co., Southington, Conn.

Whiting Corp., Quickwork Div., Harvey, Ill.
Yoder Company, Cleveland.

MALLETS, METAL WORKING

Allen, Inc., Charles I., Pequabuck, Conn. (Hickory and Lignum

Allen, Inc., Charles I., Pequabuck, Conn. (Hickory and Vitae)
Bernz Company, Otto, Rochester, N. Y. (Dogwood)
Bersted Co., Martin, Chicago, Ill (Molded composition)
Chicago Rawhide Mfg. Co., Chicago, Ill.

Densewood Corporation, Elikhorn, Wis. (Wood)
Electric Materials Co., North East, Pa. (Copper)
Goodrich Company, B. F., Akron, Ohio. (Rubber)
Greene, Tweed & Co., New York City.
Lignum-Vitae Products Corp., Jersey City, N. J.
Maplewood Machinery Co., Chicago. (Wood)

Niagara Machine & Tool Works, Buffalo.

Peck, Stow & Wilcox Co., Southington, Conn. (Wood)
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Stanley Tools, New Britain, Conn. (Soft face hammers)
Stossel & Sons Co., Carl, Front Royal, Va.
Warren Handle Works Co., Cortland, Ohio.

MATS, FOR EVAPORATIVE COOLERS

Adams Mattress Factory, Fort Worth, Tex.
Air-O-Line Co., Dallas, Texas. (Aspen Fiber)
American Excelsior Corp., Chicago.
Essick Manufacturing Company, Los Angeles. (Bronze Wool,
Aspen Fiber, Redwood Excelsior)
Eugene Excelsior Company, Eugene, Oregon.
Levy, Bros. Company, Levy, Bro Levy Bros. Company, Los Angeles. Morey, Dan, Los Angeles.

METAL CEILINGS

See Ceilings, Metal

METAL HOSE

See Hose, Metal

METAL PROTECTING See Paint, Metal Protecting

METAL SPRAY GUNS

See Guns, Spray, Metals

METAL STAMPINGS See Stampings, Metal

METALS, PERFORATED, SHEET AND PLATE

METALS, PERFORATED, SHEET AND PLATE

Beckley Perforating Co., Garwood, N. J.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Perforating Co., Chicago.
Cross Engineering Co., Carbondale, Pa.
Diamond Manufacturing Co., Wyoming, Pa.
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
International Nickel Co., Inc., New York. (Monel and nickel)
Johnston & Chapman Co., Chicago.
Littleford Bros., Inc., Cincinnati.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Mundt & Sons, Charles, Jersey City, N. J.
Nortmann-Duffke Co., Milwaukee.
Reliable Perforating Co., Chicago.
Revere Copper and Brass Incorporated, New York.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe
& Heater Co., Inc., St. Louis.
Standard Stamping & Perforating Co., Chicago.
Wickwire Spencer Steel Co., New York City.

METERS, AIR VELOCITY, DIRECT READING

Detroit Air Conditioning Service Co., Inc., Detroit. Hill, E. Vernon, Chicago. Illinois Testing Laboratories, Inc., Chicago. Taylor Instrument Companies, Rochester, N. Y.

MOTORS, DAMPERS, DUCT, MODULATING OR PROPORTIONING

Au-Temp-Co Corp., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Cook Electric Company, Chicago.
Mercold Corporation, Chicago.
Minnespolis-Honeywell Regulator Co. Minnespolis

Minneapolis-Honeywell Regulator Co., Minneapolis.
White Manufacturing Co., St. Paul, Minn.

MOTORS, DAMPER, DUCT, TWO-POSITION

Au-Temp-Co Corp., New York City.

Automatic Products Co., Milwaukee.
Automatic Temperature Control Co., Inc., Philadelphia.
Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
Cook Electric Co., Chicago.

Mercoid Corporation, Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Sampsel Time Control, Inc., Spring Valley, Ill.

Sampsel Time Control, Inc., Spring Valley, Ill. White Manufacturing Co., St. Paul. Minn.

MOTORS, DAMPERS, FURNACE DRAFT, ELECTRICAL

Au-Temp-Co Corp., New York City.

• Automatic Products Co., Milwaukee.
Barber-Colman Co., Rockford, Ill.

Barber-Colman Co., Rockford, Ill.
Barclay, Inc., Robert, Chicago.
Cook Electric Co., Chicago.
Crise Electric Mfg. Co., Columbus, Ohio.
Defender Automatic Regulator Co., St. Louis.
General Controls Co., Glendale, Cal.
Gleason-Avery, Inc., Auburn, N. Y.
Mercold Corporation, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Pioneer Heat Regulator Division, Master Electric Co., Dayton, O.
Russell Electric Co., Chicago.
Sampsel Time Control, Inc., Spring Valley, Ill.
Spencer Thermostat Company, Attleboro, Mass. Spencer Thermostat Company, Attleboro, Mass.

White Manufacturing Co., St. Paul, Minn.

· White-Rodgers Electric Co., St. Louis

MOTORS, ELECTRIC, FRACTIONAL H. P.

Baldor Electric Co., St. Louis Barber-Colman Co., Rockford, Ill. (A. C.)
Bodine Electric Co., Chicago.
Brown-Brockmeyer Co., Inc., Dayton, Ohio.
Canatsey Electric Mfg. Co., Kansas City, Mo.

Century Electric Co., St. Louis.
Delco Appliance Div. General Motors Corp., Rochester, N. Y.
Delco Products Division, General Motors Corp., Dayton, Ohio.
Diehl Mfg. Co., Somerville, N. J.
Dynamic Air Engiheering, Inc., Los Angeles.
Eastern Air Devices, Inc., Brooklyn.
Emerson Electric Mfg. Co., St. Louis.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Holtzer-Cabot Electric Co., Boston.
Howell Electric Motors Co., Howell, Mich.
Janette Mfg. Co., Chicago.
Leland Electric Co., Inc., Dayton, Ohio.
Marathon Electric Mfg. Corp., Wausau, Wis.
Master Electric Mfg. Co., Cleveland.
Peerless Electric Co., Dayton, Ohio.
Ohio Electric Mfg. Co., Cleveland.
Peerless Electric Co., Warren, Ohio.
Reynolds Electric Co., Warren, Ohio.
Russell Electric Co., Chicago.
Signal Electric Mfg. Co., Chicago.
Signal Electric Mfg. Co., Inc., F. A., Rochester, N. Y.
Speedway Mfg. Co., Clcero, Ill.
Star Electric Motor Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles.
Sturtevant Co., B. F., Hyde Park, Boston.
U. S. Electrical Motors, Inc., Los Angeles.
Victor Electric Products, Inc., Cincinnati.
Wagner Electric Corp., St. Louis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

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MOTORS, ELECTRIC, I H. P. AND OVER

MOTORS, ELECTRIC, I H. P. AND OVER

Allis-Chalmers Mfg. Co., Milwaukee.

Allis Co., Louis, Milwaukee.

Baldor Electric Co., St. Louis.

Bogue Electric Co., Paterson, N. J.

Brown-Brockmeyer Co., Inc., Dayton, Ohio.

Burke Electric Co., Erie, Pa.

Canatsey Electric Mfg. Co., Kansas City, Mo.

Century Electric Co., St. Louis.

Continental Electric Co., Inc., Newark, N. J.

Crocker-Wheeler Elec. Mfg. Co., Ampere, N. J.

Delco Products Divison, General Motors Corp., Dayton, Ohio.

Diehl Mfg. Co., Somerville, N. J.

Electric Machinery Mfg. Co., Minneapolis.

Emerson Electric Mfg. Co., St. Louis.

Fairbanks, Morse & Co., Chicago.

General Electric Co., Schenectady, N. Y.

Howell Electric Motors Co., Howell, Mich.

Ideal Electric & Mfg. Co., Mansfield, Ohio.

Imperial Electric Co., Inc., Dayton, Ohio.

Marathon Electric Mfg. Corp., Wausau, Wis.

Marble-Card Electric Co., Gladstone, Mich.

Master Electric Co., Dayton, Ohio.

Peerless Electric Co., Warren, Ohio.

Philadelphia Gear Co., Philadelphia. (Geared)

Reliance Elec. & Engr. Co., Cleveland.

Robbins & Myers, Inc., Springfield, Ohio.

Star Electric Motor Co., Bloomfield, N. J.

Sterling Electric Motors, Inc., Los Angeles.

Sturtevant Co., B. F., Hyde Park, Boston.

U. S. Electrical Motors, Inc., Los Angeles.

Wagner Electric Corp., St. Louis.

Westinghouse Electric & Mfg. Co., East Pittsburgh.

MOTORS, TIMING

Automatic Temperature Control Co., Inc., Philadelphia. Eastern Air Devices, Inc., Brooklyn.
Hansen Mfg. Co., Inc., Princeton, Ind.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Paragon Electric Co., Chicago.

Penn Electric Switch Co., Goshen, Ind.

MOULDING AND TRIM, ORNAMENTAL, for CABINETS and CASINGS

Alden Manufacturing Co., Painesville, O.
Allmetal Weatherstrip Co., Chicago.
Aluminum Co. of America, Pittsburgh.
Aluminum Goods Mfg. Co., Manitowoc, Wis.
Brasco Manufacturing Co., Harvey, Ill.
Briggs Mfg. Co., Detroit.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Dahlstrom Metallic Door Co., Jamestown, N. Y.
Detroit Moulding Div., Detroit. Detroit Moulding Div., Detroit.
Empire Door Co., Inc., New York City.
Extruded Plastics, Inc., Norwalk, Conn.
Friedley-Voshardt Co., Chicago.
Green Mfg. Co., Chicago.
Herron-Zimmers Moulding Co., Detroit. Jamestown Metal Corp., Jamestown, N. Y. Kawneer Co., Niles, Mich. Ladon Co., Chicago Lau Blower Co., Dayton, O.
 Ledkote Products Co., Long Island City, N. Y.

Lees, John, Div. Serrick Corp., Muncie, Ind.
Martin-Parry Corp., York, Pa.
Maysteel Products, Inc., Mayville, Wis.
Mesker & Co., Geo. L., Evansville, Ind.
Miller & Doing, Brooklyn, N. Y.
Pyramid Metals Co., Chicago.
United Metal Prod. Div., Canton, O.
United States Stoneware Co., Akron, O., and New York City.
Werner Co., Inc., R. D., New York City. (Plastic)

MOULDINGS, METAL, FOR SUBSTITUTE DUCTS

· Sheetlock Co., Chicago.

MOULDINGS, WOOD, FOR SUBSTITUTE DUCTS

Klomparens Lock-Joint Co., Bethesda, Md.

NAILS, ALUMINUM

Aluminum Co. of America, Pittsburgh. Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. Hassall, Inc., John, Brooklyn.

NAILS, COPPER

American Steel & Wire Co., Cleveland.
Angell Nail & Chaplet Co., Cleveland.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Clendenin Brothers, Inc., Baltimore.
Columbia Steel Co., San Francisco.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Copperweld Steel Co., Glassport, Pa.
Downs-Smith Brass & Copper Co., New York City.
Hassall. Inc., John. Brooklyn.

Hassall, Inc., John, Brooklyn.

Hussey & Co., C. G., Pittsburgh.

Maze Co., W. H., Peru, Ill.

Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, HARDENED MASONRY

American Steel & Wire Co., Cleveland.
Hillwood Manufacturing Co., Cleveland. (Concrete Pinsors)
Parker-Kalon Corp., New York City.
Rawlplug Co., Inc., New York City.
Tremont Nail Co., Wareham, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

NAILS, ROOFING

American Steel & Wire Co., Cleveland.

Angell Nail & Chaplet Co., Cleveland.

Berger Mfg. Div. of Republic Steel Corp., Canton, O.

Bethlehem Steel Co., Bethlehem, Pa.

Chase Brass & Copper Co., Inc., Waterbury, Conn.

Columbia Steel Co., San Francisco, Calif.

Conklin Brass & Copper Co., Inc., T. E., New York City.

(Copper) (Copper)

Copper)

Cottinental Steel Corp., Kokomo, Ind.

Deniston Co., Chicago.

Dickson Weatherproof Nail Co., Evanston, Ill. (Lead headed).

Downs-Smith Brass & Copper Co., New York City.

Edwards Mfg. Co., Inc., Cincinnati.

Globe Iron Roofing & Corrugating Co., Newport, Ky.

Hassall, Inc., John, Brooklyn.

Hussey & Co., C. G., Pittsburgh.

Jones & Laughlin Steel Corp., Pittsburgh.

Malleable Iron Fittings Co., Branford, Conn.

Maze Co., W. H., Peru, Ill.

Milcor Steel Co., Milwaukee.

New Delphos Manufacturing Co., Delphos, O.

Republic Steel Corp., Cleveland.

Turner & Seymour Mfg. Co., Torrington, Conn.

Wheeling Corrugating Co., Wheeling, W. Va.

Wheeling Steel Corp., Wheeling, W. Va.

Youngstown Sheet & Tube Co., Youngstown, O. · Continental Steel Corp., Kokomo, Ind.

NAILS, SCREW, HARDENED

American Steel & Wire Co., Cleveland. Dickson Weatherproof Nail Co., Evanston, Ill.
Hillwood Manufacturing Co., Cleveland. (Drive)
Jones & Laughlin Steel Corp., Pittsburgh.
Maze Co., W. H., Peru, Ill.
Parker-Kalon Corp., New York City.
Republic Steel Corp., Cleveland, O.

NAILS, STAINLESS STEEL

American Steel & Wire Co., Cleveland.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Hassall, Inc., John, Brooklyn.
Republic Steel Corp., Cleveland.
Tremont Nail Co., Wareham, Mass.
Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, ZINC COATED

American Steel & Wire Co., Cleveland.
American Zinc Products Co., Greencastle, Ind.
Angell Nail & Chaplet Co., Cleveland.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.

Bethlehem Steel Co., Bethlehem, Pa.

Columbia Steel Co., San Francisco.

Continental Steel Corp., Kokomo, Ind.
Dickson Weatherproof Nail Co., Evanston, Ill.
Hassall, Inc., John, Brooklyn.
Jones & Laughlin Steel Corp., Pittsburgh.
Malleable Iron Fittings Co., Branford, Conn.
Maze Co., W. H., Peru, Ill.
Republic Steel Corp., Cleveland.

Temessee Coal, Iron & Raibroad Co., Birmingham, Ala.
Tremont Nail Co., Wareham, Mass.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

NAME PLATES

See Hardware, for Cabinets and Casings

NIBBLERS See Machines, Nibbling

NIGHT AIR FANS See Fans, Night Air Cooling

NOZZLES, SPRAY, WATER

American Cooling Tower Co., Kansas City, Mo.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
April Showers Co., Washington, D. C.
Bahnson Co., Winston-Salem, N. C.
Balloffett Dies & Nozle Co., Inc., Guttenberg, N. J.
Benjamin Air Rifie Co., St. Louis.
Betz Engineering Co., Kansas City, Mo.
Binks Mfg. Co., Chicago.
Buffalo Forge Co., Buffalo.
Chain Belt Co., Milwaukee.

Buffalo Forge Co., Buffalo.
Chain Belt Co., Milwaukee.
Clarage Fan Co., Kalamazoo, Mich.
DeVilbiss Co., Toledo, O.
Eclipse Air Brush Co., Inc., Newark, N. J.
Hubbard Co., Minneapolis.

Eclipse Air Brush Co., Inc., Newark, N. J.
Hubbard Co., Minneapolis.
Link-Belt Co., Chicago.
Lonn Mfg. Co., Inc., Chicago.

McDonnell & Miller, Chicago.
Marley Co., Kansas City, Kan.
Martocello & Co., Jos. A., Philadelphia.
Monarch Mfg. Works, Inc., Philadelphia.
National Engineering & Manufacturing Co., Kansas City, Mo.
Phillips Cooling Tower Co., Inc., New York City.
Rega Mfg. Co., Rochester, N. Y.
Ross Heater & Mfg. Co., Inc., Buffalo.
Schubert-Cristy Corp., Indio, Calif.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Chicago.
Spray Wheel Air Conditioners, Inc., Denver.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Hyde Park, Boston.
Supreme Electric Products Corp., Rochester, N. Y.
Water Cooling Corp., New York City.
Water Cooling Equipment Corp., St. Louis.
Yarnall-Waring Co., Philadelphia.

NUTS, SHEET METAL

Tinnerman Products, Inc., Cleveland.

ODOR ADSORBERS See Adsorbers, Odor

OFFSETS, FURNACE PIPE See Fittings and Accessories, Furnace Pipe

> OIL BURNERS See Burners, Oil

ORNAMENTS, SHEET METAL See Mouldings and Trim, Ornamental

OXY-ACETYLENE WELDING EQUIPMENT See Welding Equipment, Oxy-Acetylene

OZONE APPARATUS

Automatic Pump & Softener Corp., Rockford, Ill.

Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Coroaire Heater Corp., Cleveland.
Electroaire Corp., Chicago.
Lohman, Inc., Wm. J., Irvington, N. J.
Montgomery Bros., San Francisco.
Norwood Filtration Co., The, Florence, Mass.
Ozone Air Co., Grand Rapids, Mich.
Ozo-Ray Process Corp., Chicago.

Sealkote Corp., Chicago. United States Ozone Co. of America, Scottdale, Pa.

PAINT, ALUMINUM

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
Allen Co., Inc., L. B., Chicago.
Aluminum Co. of America, Pittsburgh.
American-Marietta Co., Chicago.
Asphalt Products Co., Inc., Syracuse, N. Y.
Baer Brothers, New York City.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carter Paint Co., Liberty, Ind.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York Cit. Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
Dragert Co., Inc., C. H., Brooklyn.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Flood Company, Cleveland.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co. Div. of Glidden Co., Chicago
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Pittsburgh. Inter-Coastal Paint Co., East St. Louis, III.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Co., Pittsburgh.
Krehblel Co., J. H., Chleago.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
National Mfg. Corp., Tonowanda, N. Y.
Nebel Manufacturing Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Pittsburgh Plate Glass Co., Pittsburgh.
Presstite Engineering Co., St. Louis.
Pyrolite Products Co., Cleveland.
Quigley Co., Inc., New York City. (Vehicle Only)
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Wilson Co., Ludwig, Chicago.

PAINT, CONCRETE, WATERPROOFING

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acorn Refining Co., Cleveland.
American-Marietta Co., Chicago.
Asphalt Products Co., Inc., Syracuse, N. Y.
Baer Brothers, New York City.
Barber Asphalt Corp., Barber, N. J.
Barrett Div., Allied Chemical & Die Corp., New York City.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia.
Coddington Manufacturing Co., E. D., Milwaukee.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Continental Products Co., Euclid, O.
Devoe & Raynolds Co., Inc., New York City. Devoe & Raynolds Co., Inc., New York City. du Pont de Nemours & Co., E. I., Wilmington, Del. Flintkote Co., New York City. Gerard Chemical Co., Elizabeth, N. J. Gelidden Co., Cleveland.

Hague & Co., Inc., Alfred, Brooklyn.

Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.

Hilo Varnish Corp., Brooklyn.

Horn Co., A. C., Long Island City, N. Y.

Iowa Paint Mfg. Co., Des Moines, Ia. Koppers Co., Pittsburgh. Lastik Products Co., Inc., Pittsburgh. Koppers Co., Pittsburgh.
Lastik Products Co., Inc., Pittsburgh.
Lehon Co., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
Nebel Manufacturing Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Ohmlac Paint & Refining Co., Chicago.
Paint-Point Corp., Newark, N. J.
Pecora Paint Co., Philadelphia.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Pyrolite Products Co., Cleveland.
Reilly Tar & Chemical Corp., Indianapolis.
Saverite Engineering Co., Hoboken, N. J.
Self-Vulcanizing Rubber Co., Inc., Chicago.
Sherwin-Williams Co., Cleveland.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, Staten Island, N. Y.
Tropical Paint & Oil Co., Cleveland.

Truscon Laboratories, Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
United States Gypsum Co., Chicago.
United States Stoneware Co., Akron, O., and New York City.
Walles Dove-Hermiston Corp., Westfield, N. J.
Wilhelm Co. A. Reading, Pa. Wilhelm Co., A., Reading, Pa.

PAINT, COPPER

Acme White Lead & Color Works, Detroit.

Baer Brothers, New York City.

Debevoise Co., Brooklyn.

Devoe & Raynolds Co., Inc., New York City.

Glidden Company, Cleveland.

Lucas & Co., Inc., John, Philadelphia.

Pittsburgh Piate Glass Co., Pittsburgh.

Sherwin-Williams Co., Cleveland.

Sipe & Co., James B., Pittsburgh.

Stokes, Jr., J. W., Brooklyn.

U. S. Gutta Percha Paint Co., Providence, R. I.

PAINT, CRACKLE FINISH

Acme White Lead & Color Works, Detroit.
Baer Brothers, New York City.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hilo Varnish Corp., Brooklyn.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Lucas & Co., Inc., John, Philadelphia.
Maas & Waldstein Co., Newark, N. J.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Roxalin Flexible Finishes, Inc., Elizabeth, N. J.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland. Acme White Lead & Color Works, Detroit. Sherwin-Williams Co., Cleveland.
Wattenamel Co., Summit, Ill.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, HOT SURFACES

PAINT, HOT SURFACES

Acme Refining Co., Cleveland.
Acme White Lead & Color Works, Detroit.
Acon Refining Co., Cleveland.

Allen Co., Inc., L. B., Chicago.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Baer Brothers, New York City.
Barrett Div., Allied Chemical & Die Corp., New York City.
Cabot, Inc., Samuel, Boston.
Calbar Paint & Vanish Co., Philadelphia.

Carey Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Continental Products Co., Euclid, O.
Dampney Co. of America, Hyde Park, Boston,
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Gerard Chemical Co., Elizabeth, N. J.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Hilo Varnish Corp., Brooklyn.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Krehbiel Co., J. H., Chicago.
Laclede-Christy Clay Products Co., St. Louis.
Lastik Products Co., Inc., Pittsburgh.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland.
National Engineering Products, Inc., Washington, D. C.
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cieveland.
Nelson Mfg. Co., B. F., Minneapolis.
O'Brien Varnish Co., South Bend, Ind.
Ohmlac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
O'Brien Varnish Co., Scleveland.
Sipe & Co., James B., Pittsburgh.
Protective Coatings, Inc., Detroit.
Pyrolite Products Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Gutts Percha Paint Co., Providence, R. I.
Walles Dove-Hermiston Corp., Westfield, N. J.
Westinghouse Electric & Mfg. Co., East Pittsburgh.
Wilson Co., Ludwig, Chicago.

PAINT, METAL PROTECTING, FINISH COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit. Acorn Refining Co., Cleveland. American-Marietta Co., Chicago. Barrett Div., Allied Chemical & Dye Corp, New York City.

Cheesman-Elliot Co., Inc., Brooklyn. Continental Products Co., Euclid, O. Debevoise Co., Brooklyn. Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Glidden Co., Cleveland. du Pont de Nemours & Co., E. I., Wilmington, Del.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
Midland Paint & Varnish Co., Cleveland. (Red)
Mortell Co., J. W., Kankakee, Ill.
National Lead Co., New York City.
Nelson Mfg. Co., B. F., Minneapolis.
North American Fibre Products Co., Cleveland.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sanvin Chemical Products Co., Moline, Ill.
Sherwin-Williams Co., Cleveland.
Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New
York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tamms Sillca Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Inc., Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilson Co., Ludwig, Chicago.

PAINT, METAL PROTECTING, FINISH COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.

American-Marietta Co., Chicago.

Barrett Div., Allied Chemical & Dye Corp., New York City.

Carter Paint Co., Liberty, Ind.

Cheesman-Eillot Co., Inc., Brooklyn.

Continental Products Co., Euclid, O.

Debevoise Co., Brooklyn.

Detroit Graphite Co., Detroit.

Devoe & Raynolds Co., Inc., New York City.

du Pont de Nemours & Co., E. I., Wilmington, Del.

Glidden Co., Cleveland.

Heath & Milligan Mfg. Co., Chicago.

Inter-Coastal Paint Corp., East St. Louis, Ill.

Lucas & Co., Inc., John, Philadelphia.

Marley Chemical Co., Detroit.

Midland Paint & Varnish Co., Cleveland. (Graphite)

National Lead Co., New York City.

Nelson Mfg. Co., B. F., Minneapolis.

O'Brien Varnish Co., South Bend, Ind.

Ohmiac Paint & Refining Co., Chicago.

Patterson-Sargent Co., Cleveland.

Pittsburgh Plate Glass Co., Pittsburgh.

Protective Coatings, Inc., Detroit.

Quigley Co., Inc., New York City.

Reilly Tar & Chemical Corp., Indianapolis.

Sanvin Chemical Products Co., Moline, Ill.

Sherwin-Williams Co., Cleveland.

Sipe & Co., James B., Pittsburgh.

Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City.

Sonneborn Sons, Inc., L., New York City. York City.

Sonneborn Sons, Inc., L., New York City.

Southport Paint Co., Savannah, Ga.

Tamms Silica Co., Chicago.

Tropical Paint & Oil Co., Cleveland.

Truscon Laboratories, Detroit.

United Chromium, Inc., New York City.

U. S. Gutta Percha Paint Co., Providence, R. I.

U. S. Stoneware Co., Akron, O., and New York City.

Walles Dove-Hermiston Corp., Westfield, N. J.

Wilson Co., Ludwig, Chicago. Wilson Co., Ludwig, Chicago. Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, METAL PROTECTING, PRIME COAT, BRUSH APPLIED

Acme White Lead & Color Works, Detroit.

Acorn Refining Co., Cleveland.

American Chemical Paint Co., Ambler, Pa.

American-Marietta Co., Chicago.

Carey Mfg. Co., Philip, Lockland, O.

Carter Paint Co., Liberty, Ind.

Cheesman-Elliot Cd., Inc., Brooklyn.

Continental Products Co., Euclid, O.

Debevoise Company, Brooklyn.

Detroit Graphite Co., Detroit.

Devoe & Raynolds Co., Inc., New York City.

du Pont de Nemours & Co., E. I., Wilmington, Del.

Flood Co., Cleveland.

adex to Advertisers, page 314. Advertisement in this issue. See Index to Advertisers, page 314.

Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit. Midland Paint & Varnish Co., Cleveland.

National Engineering Products, Inc., Washington, D. C.

National Lead Co., New York City.

Nebel Manufacturing Co., Cleveland.

Nelson Mfg. Co., B. F., Minneapolis.

O'Brien Varnish Co., South Bend, Ind.

Ohnilac Paint & Refining Co., Chicago. O'Brien Varnish Co., South Bend, Ind.
Ohmlac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland.
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh. Socony Paint Products Div., Socony-Vacuum Oil Co., Inc., New York City. York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
Turco Products, Inc., Los Angeles.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilson Co., Ludwig. Chicago.

PAINT, METAL PROTECTING, PRIME COAT, SPRAY APPLIED

Acme White Lead & Color Works, Detroit.
American Chemical Paint Co., Ambler, Pa.
American-Marietta Co., Chicago.
Carey Mfg. Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Continental Products Co., Euclid, O.
Debevoise Co., Brooklyn, N. Y.
Detroit Graphite Co., Detroit.
Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Flood Co., Cleveland.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago. Flood Co., Cleveland.
Glidden Co., Cleveland.
Heath & Milligan Mfg. Co., Chicago.
Hilo Varnish Corp., Brooklyn. (Zinc Chromate)
Inter-Coastal Paint Corporation, East St. Louis, Ill.
Lucas & Co., Inc., John, Philadelphia.
Marley Chemical Co., Detroit.
National Engineering Products, Inc., Washington, D. C.
National Lead Co., New York City.
Nelson Mfg. Co., B. F., Minneapolis. (Asphalt Base)
New Jersey Zinc Co., New York City.
O'Brien Varnish Co., South Bend, Ind.
Ohmiac Paint & Refining Co., Chicago.
Patterson-Sargent Co., Cleveland, O.
Pittsburgh Plate Glass Co., Pittsburgh.
Quigley Co., Inc., New York City.
Reilly Tar & Chemical Corp., Indianapolis.
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Socony Paint Products Div., Socony Vacuum Oil Co., Inc., New York City.
Sonneborn Sons, Inc., L., New York City.

York City.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Tropical Paint & Oil Co., Cleveland.
Truscon Laboratories, Detroit.
United Chromium, Inc., New York City.
U. S. Gutta Percha Paint Co., Providence, R. I.
U. S. Stoneware Co., Akron, O., and New York City.
Wilson Co., Ludwig, Chicago.
Zapon Div., Atlas Powder Co., North Chicago, Ill.

PAINT, ROOFING

Acme Refining Co., Cleveland.

Acme White Lead & Color Works, Detroit.

Acorn Refining Co., Cleveland.

American-Marietta Co., Chicago.

Asphalt Products Co., Inc., Syracuse, N. Y.

Baer Brothers, New York City.

Barber Asphalt Corp., Barber, N. J.

Barrett Div., Allied Chemical & Die Corp., New York City.

(Pitch) (Pitch) (Pitch)
Cabot, Inc., Samuel, Boston.
Calbar Paint & Varnish Co., Philadelphia.
Carey Co., Philip, Lockland, O.
Carter Paint Co., Liberty, Ind.
Cheesman-Elliot Co., Inc., Brooklyn.
Clinton Metallic Paint Co., Clinton, N. Y. (Red Metallic and Vanction) Venetian) Connors Paint Mfg. Co., Wm., Troy, N. Y. Continental Products Co., Euclid, O. (All Kinds) Debevoise Co., Brooklyn.

Devoe & Raynolds Co., Inc., New York City.
du Pont de Nemours & Co., E. I., Wilmington, Del.
Evercrete Corp., New York City.
Flinkote Co., New York City.
Ford Roofing Products Co., Chicago.
Glidden Co., Cleveland.
Hague & Co., Inc., Alfred, Brooklyn.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago.
Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Inter-Coastal Paint Co., East St. Louis, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)
Koppers Co., Pittsburgh. (Bituminous)
Krehbiel Co., J. H., Chicago.
Lastik Products Co., Inc., Pittsburgh. (Asphalt, Tar)
Lehon Co., Chicago. Krehbiel Co., J. H., Chicago.
Lastik Products Co., Inc., Pittsburgh. (Asphalt, Tar)
Lehon Co., Chicago.
Lucas & Co., Inc., John, Philadelphia.
Lyon, Conklin & Co., Inc., Baltimore.
Metropolitan Refining Co., Long Island City, N. Y.
Midland Paint & Varnish Co., Cleveland. (Fibercote)
National Mfg. Corp., Tonawanda, N. Y.
Nebel Manufacturing Co., Cleveland.
Nelson Mfg. Co., B. F., Minneapolis.
North American Fibre Products Co., Cleveland.
Ohmlac Paint & Refining Co., Chicago, Ill. (Asphalt)
Pittsburgh Plate Glass Co., Pittsburgh.
Protective Coatings, Inc., Detroit. (Non-oxidizing)
Pyrolite Products Co., Cleveland.
Rellly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh. (Processed Asphalt)
Ruberold Co., New York City.
Rutland Fire Clay Co., Rutland, Vt. (Asphalt)
Sherwin-Williams Co., Cleveland.
Sipe & Co., James B., Pittsburgh.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Tamms Silica Co., Chicago.
Thompson & Co., Oakmont (Pittsburgh Dist.), Pa.
Toch Brothers, Inc., Elm Park, S. I., N. Y.
Tropical Paint & Oil Co., Cleveland. Troch Brothers, Inc., Elm Park, S. I., N. Y.
Tropical Paint & Oll Co., Cleveland.
Truscon Laboratories, Detroit.
U. S. Gutta Percha Paint Co., Providence, R. I.
United States Gypsum Co., Chicago.
Wilson Co., Ludwig, Chicago.

PAINT SPRAY GUNS See Guns, Spray, Paint

PAPER, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago.

Carey Co., Philip, Lockland, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Johns-Manville, New York City.

Keasbey & Mattison Co., Ambler, Pa.
Linear Packing & Rubber Co., Inc., Tacony, Philadelphia.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberold Co., New York City.

Sall Mountain Co., Chicago.

Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.

Wilson, Inc., Grant, Chicago.

· Wilson, Inc., Grant, Chicago.

PARTS, for HEATING and AIR CONDITIONING EQUIPMENT

(Tank Heads and Bottoms, Water Heater Legs)

Ackermann Mfg. Co., Wheeling, W. Va. (Furnace Heads). Anemostat Corporation of America, New York City. Commercial Shearing & Stamping Co., Youngstown, O. Detroit Stamping Co., Detroit. Lindsay & Lindsay, Chicago.

PASTE, ASBESTOS PAPER

Acme Asbestos Covering & Flooring Co., Chicago.
Clark Stek-O Corp., Rochester, N. Y.
Lyon, Conklin & Co., Inc., Baltimore.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Sall Mountain Co., Chicago.
Smith & Kanzler Corp., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago.
Western Mineral Products Co. Omaha, Nebr.

Western Mineral Products Co., Omaha, Nebr. • Wilson, Inc., Grant, Chicago.

PATTERNS, BLUE PRINT, ELBOWS, SKYLIGHTS and FITTINGS

· Gray, G. L., New Haven, Conn.

PERFORATED METAL See Metals, Perforated, Sheet and Plate

PILLOW BLOCKS

See Bearings, Pillow Block • Advertisement in this issue. See Index to Advertisers, page 31:.

PIPE, CONDUCTOR

PIPE, CONDUCTOR

Ames Co., W. R., San Francisco.
Barnes Metal Products Co., Chicago.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.

Berger Bros. Co., Philadelphia.
Berger Mfg. Div. of Republic Steel Corp., Canton, O.
Braden Mfg. Co., Terre Haute, Ind.
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Downs-Smith Brass & Copper Co., New York City.
Edwards Manufacturing Co., Inc., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Herbert & Sons, T. L., Nashville, Tenn.

Hussey & Co., C. G., Pittsburgh. (Copper)
Klauer Manufacturing Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamb & Ritchie Co., Cambridge, Mass.
Lyon, Conklin & Co., Inc., Baltimore.
Milcor Steel Co., Milwaukee.
Miller & Doing, Brooklyn.
New Delphos Manufacturing Co., Delphos, O.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Osborn Co., J. M., & L. A., Cleveland.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
St. Paul Corrugating Co., St. Paul, Minn.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Products Co., Peorla, Ill.
Tiffin Eaves Trough Clamp Co., Tiffin, O.
Tri-State Heating Supply Co., Fort Wayne, Ind.
Wheeling Corrugating Co., O, Wheeling, W. Va.
Williams-Wallace Co., San Francisco.
Woolwine Metal Products Co., Los Angeles.
York Corrugating Co., York, Pa.

PIPE, FURNACE

Acer & Whedon, Inc., Medina, N. Y.
Acme Tin Plate & Roofing Supply Co., Philadelphia.
Biersach & Niedermeyer Co., Milwaukee.
Braden Mfg. Co., Terre Haute, Ind.
Champion Furnace Pipe Co., Peoria, Ill.
Char-Gale Mfg. Co., Minneapolis.
Chicago Furnace Supply Co., Chicago.
Chicago Metal Mfg. Co., Chicago.
Chicago Metal Mfg. Co., Chicago.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Shamping Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
Corbman Bros., Inc., Philadelphia.
Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steve & Mfg. Co., Quincy, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Green Colonial Furnace Co., Des Moines.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
International Heater Co., Utica, N. Y.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y.
Keith Furnace Co., Des Moines, Ia.
La Crosse Steel Roofing & Corrugating Co, La Crosse,

La Crosse Steel Roofing & Corrugating Co, La Crosse, Wis. Lamneck Products, Inc., Middletown, O. Lennox Furnace Co., Marshalltown, Ia. Lyon, Conklin & Co., Inc., Baltimore. Majestic Co., Huntington, Ind.

Lennox Furnace Co., Marshalltown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.

Majestic Co., Huntington, Ind.

Maple City Furnace Co., Monmouth, Ill.
Milcor Steel Co., Milwaukee.

Muelier Furnace Co., L. J., Milwaukee.

Osborn Co., J. M., & L. A., Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
Schecter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Sheet Metal Specialty Co., Pittsburgh.
Skinner Htg. & Vent. Co., Heater Div. of St. Louis Blow Pipe
& Heater Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Stratton & Terstegge Co., Louisville, Ky.
Tiffin Eaves Trough Clamp Co., Tiffin, O.
United States Register Co., Battle Creek, Mich.
Waterman-Waterbury Co., Minneapolis.
Wheeling Corrugating Co.. Wheeling, W. Va.
Williamson Heater Co., Cincinnati.
Williamson Heater Co., Cincinnati.

PIPE, SMOKE

Acer & Whedon, Inc., Medina, N. Y Acme Tin Plate & Roofing Supply Co., Philadelphia. Bieler & Son, L., Long Island City, N. Y. Biersach & Niedermeyer Co., Milwaukee. Bovee Furnace Works, Waterloo, Ia. (Cast Iron) Braden Mfg. Co., Terre Haute, Ind.
Campbell Heating Co., Des Moines, Ia.
Champion Furnace Pipe Co., Peorla, Ill.
Char-Gale Mfg. Co., Minneapolis.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Cincinnati Stamping Co., Cincinnati.
Corbman Bros., Inc., Philadelphia.

Detroit Safety Furnace Pipe Co., Detroit.
Excelsior Steol Furnace Co., Chicago.
Excelsior Stove & Mfg. Co., Quincy, Ill.
Galva Heater Co., Galva, Ill. (Cast Iron)
Green Colonial Furnace Co., Des Moines, Ia.
Herbert & Sons, T. L., Nashville, Tenn.
Home Furnace Co., Holland, Mich.
Howes-Woods Co., Cambridge, Mass.
International Heater Co., Uttca, N. Y.
Juniper Elbow Co., Inc., Middle Village, L. I., N. Y.
Keith Furnace Co., Des Moines, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lamneck Products, Inc., Middletown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.

Majestic Co., Huntington, Ind.
Maple City Furnace Co., Monmouth, Ill.
Marshall Furnace Co., Missahalltown, Ia.
Lyon, Conklin & Co., Inc., Baltimore.

Majestic Co., Huntington, Ind.
Maple City Furnace Co., Mershall, Mich.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee.

Mueller Furnace Co., L. J., Milwaukee.

Osborn Co., J. M. & L. A., (Cleveland.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Patten Co., J. V., Sycamore, Ill.
Peerless Foundry Co., Indianapolis.
Portland Stove Foundry Co., Portland, Me.
Puhl & Hepper Mfg. Co., Inc., St. Louis.
Reeves Steel & Mfg. Co., Dover, O.
Riggin Metal Products, Inc., Kankakee, Ill.
Scheeter Brothers Co., Philadelphia.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., St. Louis.
Standard Furnace & Supply Co., Omaha, Nebr.
Ster-Na-Man Foundry Co., Springfield, Ill. (Cast Iron)
Stratton & Terstegge Co., Louisville, Ky.
Tiffin Eaves Trough Clamp Co., Tiffin, O.
Tri-State Heating Supply Co., Fort Wayne, Ind.
United States Register Co., Metelro, Ia. (Cast Iron)
Waterman-Waterbury Co., Minneapolls.
Wheeling Corrugating Co., Wheeling, W. Va.
Williams-Wallace Co., San Francisco.

PIPE LOCK FORMERS

See Machines, Pipe, Lock Forming

PIPE & FITTINGS, GAS VENT AND FLUE

Char-Gale Mfg. Co., Minneapolis. (Blue and Galvanized)
Cincinnati Sheet Metal & Roofing Co., Cincinnati.

Condensation Engineering Corp., Chicago. (Vitreous Enamel)
Heremetal Co., Minneapolis. (Heresite Coated)
Johns-Manville, New York City.
Laclede Steel Co., St. Louis. (Butt Weld—Wrought Steel)

Osborn Co., J. M. & L. A., Cleveland.

Payne Furnace & Supply Co., Beverly Hills, Calif. (Insulated Aluminum)

Aluminum) Wilder Manufacturing Co., Niles, O. Williams-Wallace Co., San Francisco.

PIPE AND FITTINGS, SHEET METAL

See Ducts and Fittings, Prefabricated

PITTSBURGH LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

PLATES, ALLOY

Allegheny Ludium Steel Corp., Brackenridge, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh.
American Brass Co., Waterbury, Conn. (Copper)
American Rolling Mill Co., Middletown, O.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Carnegie-Illinois Steel Corp., Pittsburgh.
Chase Brass & Copper Co., Inc., Waterbury, Conn. (Copper and its alloys) its alloys) Colonial Alloys Co., Philadelphia. (Stainless)
Dow Chemical Co., Midland, Mich.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stain-

less Clad)

less Clad)
Jessop Steel Co., Washington, Pa. (Air Craft)
Lukens Steel Co., Coatesville, Pa.
Republic Steel Corp., Cleveland.
Revere Copper & Brass, Inc., New York City.
Universal-Cyclops Steel Corporation, Bridgeville, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, STEEL

- American Rolling Mill Co., Middletown, O.
 Bethlehem Steel Co., Bethlehem, Pa.
 Carnegie-Illinois Steel Corp., Pittsburgh.
 Columbia Steel Co., San Francisco.
 Granite City Steel Co., Granite City, Ill. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago. (Stain-

Inland Steel Co., Chicago.

Inland Steel Co., Chicago.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh.
Lukens Steel Co., Coatesville, Pa.
Republic Steel Corp., Cleveland.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Weirton Steel Co., Weirton, W. Va.
Wood Steel Co., Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, WROUGHT IRON

Byers Co., A. M., Pittsburgh.

POLISHERS

See Buffers, Grinders, Polishers, Sanders and Finishers, Metal

PREFABRICATED DUCTS

See Ducts and Fittings, Prefabricated

PRESSES AND DIES

Bath Co., Cyril, Cleveland.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Toledo, O.
Callahan Can Machine Co., Inc., Brooklyn.
Cincinnati Shaper Co., Cincinnati.
Clearing Machine Corp., Chicago.
Cleveland Punch & Shear Works Co., Cleveland.
Continental Machines, Inc., Minneapolis.

Dreis & Krump Mfg. Co., Chicago.
Grand Rapids Die & Tool Co., Grand Rapids, Mich.
Henry & Wright Mfg. Co., Hartford, Conn.
Leslie Welding Co., Chicago. (Hand Punch Press)

Marshalltown Mfg. Co., Marshalltown, Ia.
Minster Machine Co., Minster, O.
New Albany Machine Mfg. Co., New Albany, Ind.

Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Perkins Machine Co., Warren, Mass.
Schatz Mfg. Co., Poughkeepsle, N. Y.
Service Machine Co., Elizabeth, N. J.
Spun Steel Corp., Canton, O.
Streine Tool & Mfg. Co., New Bremen, O.
Swain Mfg. Co., Fred J., St. Louis.

Verson Allsteel Press Co., Chicago.
Ward Machinery Co., Chicago.
Zeh & Hahnemann Co., Newark, N. J. Bath Co., Cyril, Cleveland.

Zeh & Hahnemann Co., Newark, N. J.

PROTECTORS, DOWNSPOUT

See Fittings and Accessories, Conductor

PSYCHROMETERS, SLING AND HAND-ASPIRATED

American Moistening Co., Providence, R. I.
Friez Instrument Division, Towson, Md.
G. M. Manufacturing Co., New York City.
H-B Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
Johnson Service Co., Milwaukee.
Leeds & Northrup Co., Philadelphia.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Co., Norwood, Cincinnati.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia.
Scientific Instrument Co., Detroit.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit.
Weksler Thermometer Corp., New York City. Weksler Thermometer Corp., New York City.

PULLEYS, FAN AND MOTOR

Allis-Chalmers Mfg. Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit
Dayton Rubber Mfg. Co., Dayton. O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Duro Metal Products Co., Chicago.
Gates Rubber Co., Denver, Colo.
Goldens' Fdry. & Mach. Co., Columbus, Ga. (Cast Iron)
Horton Mfg. Co., Minneapolis.
Jones Fdry. & Mach. Co., W. A., Chicago.

Lau Blower Co., Dayton, O.
Linderme Machine & Tool Co., Inc., Detroit.

Maurey Mfg. Corp., Chicago. Allis-Chalmers Mfg. Co., Milwaukee

• Advertisement in this issue. see Index to Advertisers, page 314.

Medart Co., St. Louis.

Medart Co., St. Louis.

Morrison Products, Inc., Cleveland.
Pyott Fdry. & Mach. Co., Chicago.
Reynolds Mfg. Co., Grand Rapids, Mich.
Rockwood Mfg. Co., Indianapolis.
Smith, Inc., Winfield H., Springfield, N. Y.
Spun Steel Corp., Canton, O.
Swift Mfg. Co., Detroit, Mich.

Utility Fan Corporation, Los Angeles.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

PULLEYS, FURNACE CHAIN

Hart & Cooley Mfg. Co., Holland, Mich. Medart Co., St. Louis.
Mueller Furnace Co., L. J., Milwaukee.
United States Register Co., Battle Creek, Mich.

PULLEYS, VARIABLE SPEED

Allis-Chalmers Manufacturing Co., Milwaukee.
American Pulley Co., Philadelphia.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Die Casting Co., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., Detroit.
Equipment Engineering Co., Minneapolis.
Gates Rubber Co., Sales Div., Denver, Colo.
Ideal Commutator Dresser Co., Sycamore, Ill.
Lau Blower Co., Dayton, O.
Lewellen Mfg. Co., Columbus, Ind.
Link-Belt Co., Chicago.
Mayne Products Co., Dayton, O.
Reeves Pulley Co., Columbus, Ind.
Speedmaster Co., Des Plaines, Ill.
Stephens-Adamson Mfg. Co., Aurora, Ill.
White Manufacturing Co., St. Paul.
Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, DEEP-WELL

PUMPS, DEEP-WELL

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chandler Co., Cedar Rapids, Ia.
Cook, Inc., A. D., Lawrenceburg, Ind.
Crane Co., Chicago.
Dayton Pump & Mfg. Co., Dayton, O.
Decatur Pump Co., Decatur, Iil.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago.
Goulds Pumps, Inc., Seneca Falls, N. Y.

Heil Co., Milwaukee, Wis.
Layne & Bowler, Inc., Memphis, Tenn.
Monarch Engineering Company, Dayton, O.
Myers & Bro. Co., F. E., Ashland, O.
Pacific Pump Works, Huntington Park, Calif.
Peerless Pump Division, Food Machinery Corporation, Los
Angeles.

Angeles. Angeles.
Peerless Pump Div., Food Machinery Corp., Canton, O.
Pomona Pump Co. Division, Pomona, Calif.
Red Jacket Mfg. Co., Davenport, Ia.
Uniflow Mfg. Co., Erie, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, FUEL OIL (for Oil Burners)

• Automatic Products Company, Milwaukee.

DeLaval Steam Turbine Co., Trenton, N. J.

Kraissi Co., Inc., Hackensack, N. J.

May Oil Burner Corporation, Baltimore.

Monarch Manufacturing Works, Inc., Philadelphia.

Quimby Pump Co., Inc., Newark, N. J.

Tuthill Pump Co., Chicago.

Viking Pump Company, Cedar Falls, Ia.

Webster Electric Co., Racine, Wis.

Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, SHALLOW-WELL

American-Marsh Pumps, Inc., Battle Creek, Mich. Chandler Co., Cedar Rapids, Ia. American-Marsh Pumps, Inc., Battle Creek, Mainl.
Chandler Co., Cedar Rapids, Ia.
Chicago Pump Co., Chicago.
Cook, Inc., A. D., Lawrenceburg, Ind.
Crane Co., Chicago, Ill.
Dayton Pump & Mfg. Co., Dayton, O.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Everite Pump & Mfg. Co., Inc., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Co., Frederick, Md.
Goulds Pumps, Inc., Seneca Falls, N. Y.

Heil Co., Milwaukee, Wis.
Layne & Bowler, Inc., Memphis, Tenn.
Monarch Engineering Company, Dayton, O.
Morris Machine Works, Baldwinsville, N. Y.
Myers & Bro. Co., F. E., Ashland, O.
Pacific Pump Works, Huntington Park, Calif.
Peerless Pump Division, Food Machinery Corporation, Los
Angeles.

Angeles.

Peerless Pump Div., Food Machinery Corp., Canton, O. Pomona Pump Co. Division, Pomona, Calif. Red Jacket Mfg. Co., Davenport, Ia. Robbins & Myers, Inc., Springfield, O. Roper Corp., Geo. D., Rockford, Ill. Uniflow Mfg. Co., Erie, Pa. Union Steam Pump Co., Battle Creek, Mich. Viking Pump Co., Cedar Falls, Ia. Weinman Pump Mfg. Co., Columbus, O. Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, WATER CIRCULATING

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Bell & Gossett Company, Morton Grove, Ill. Buffalo Pumps, Inc., Buffalo. Chicago Pump Co., Chicago. Decatur Pump Co., Decatur, Ill. Deming Co., Salem, O. Deming Co., Salem, O.

De Laval Steam Turbine Co., Trenton, N. J.

Economy Pumps, Inc., Hamilton, O.

Essick Mfg. Co., Los Angeles (for Evaporative Coolers).

Everite Pump & Mfg. Co., Inc., Lancaster, Pa.

Fairbanks, Morse & Co., Chicago.

Frederick Iron & Steel Co., Frederick, Md.

Goulds Pumps, Inc., Seneca Falls, N. Y.

Ingersoll-Rand, New York City.

Kehm Corporation, Chicago.

Lecourtenay Co., Newark, N. J.

Lewis & Co., Inc., Chas. S., St. Louis.

Monarch Engineering Company, Dayton, O.

Morris Machine Works, Baldwinsville, N. Y.

Myers & Bro. Co., F. E., Ashland, O.

Nash Engineering Co., South Norwalk, Conn.

National Steam Pump Co., Upper Sandusky, O.

Pacific Pump Works, Huntington Park, Calif.

Palmer Electric Co., Detroit.

Peerless Pump Division, Food Machinery Corporation, Los

Angeles. Angeles.

AOS

Peerless Pump Division, Food Machinery Corporation Angeles.

Peerless Pump Div., Food Machinery Corp., Canton, O. Pernot & Rich, Inc., Los Angeles.

Pomona Pump Co., Division, Pomona, Calif., Quimby Pump Co., Inc., Newark, N. J. Red Jacket Mfg. Co., Davenport, Ia.

Robbins & Myers, Inc., Springfield, O.
Roper Corp., Geo. D., Rockford, Ill.

Schwitzer-Cummins Co., Indianapolis.

Splegel Corporation, G. B., Chicago.

Swaby Mfg. Co., Chicago.

Trane Co., LaCrosse, Wis.

Trimount Rotary Power Co., East Dedham, Mass.

Uniflow Mfg. Co., Erle, Pa.

Union Steam Pump Co., Battle Creek, Mich.

Utility Fan Corporation, Los Angeles.

Viking Pump Co., Cedar Falls, Ia.

Well Pump Co., Chicago.

Weinman Pump Mfg. Co., Columbus, O.

Worthington Pump & Machinery Corp., Harrison, N. J.

Yeomans Bros. Co., Chicago.

PUNCHES AND SHEARS COMBINED, LEVER OPERATED

Armstrong-Bium Mfg. Co., Chicago.
Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool & Machine Co., East St. Louis, Ill.
G.D.S. Machinery & Supply Co., New York City.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whitemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
National Machine Tool Co., Racine, Wis.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Royersford Foundry & Machine Co., Royersford, Pa.
Schatz Mfg. Co., Poughkeepsie, N. Y.
Weiss & Co., H., New York City.

PUNCHES, BENCH

Armstrong-Blum Mfg. Co., Chicago.
Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Clough, A. W., Meriden, Conn.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., J. F., Burlington, Vt.
Maplewood Machinery Co., Chicago.
New Albany Machine Mfg. Co., New Albany, Ind.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Schatz Mfg. Co., Poughkeepsie, N. Y.
Welss & Co., H., New York City.
Whitney Mfg. Co., W. A., Rockford, Ill.

Whitney Metal Tool Co., Rockford, Ill.
 Wiedemann Machine Co., Philadelphia (Turret).

PUNCHES, COMBINATION HAND AND BENCH

Armstrong-Blum Mfg. Co., Chicago. Bollaert, M., Oakland, Calif. Champion Blower & Forge Co., Lancaster, Pa. Heartley Machine & Tool Co., Toledo, O.

Heartley Machine & Tool Co., Toledo, O. Hendley & Whittemore Co., Beloit, Wis.

Niagara Machine & Tool Works, Buffalo.

Parker-Kalon Corp., New York City.

Peck, Stow & Wilcox Co., Southington, Conn. Schatz Mfg. Co., Poughkeepsie, N. Y. Weiss & Co., H., New York City.

Whitney Mfg. Co., W. A., Rockford, Ill.

Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, HAND

Armstrong-Blum Mfg. Co., Chicago. Bertsch & Co., Cambridge City, Ind. Bollaert, M., Oakland, Calif.

Bollaert, M., Oakland, Calif.
Buffalo Forge Co., Buffalo.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Works Co., Cleveland.
Clough, A. W., Meriden, Conn.
Crescent Tool Co., Jamestown, N. Y.
Damascus Steel Products Corporation, Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Ingels Elbow Machine Corporation, Chicago.
Johnson, Inc., William, Newark, N. J.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Maplewood Machinery Co., Chicago.
Niagara Machine & Tool Works, Buffalo.
Parker-Kalon Corp., New York City.
Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia.

Penn Tool Co., Philadelphia.
 Schatz Mfg. Co., Poughkeepsie, N. Y.
 Service Machine Co., Elizabeth, N. J.
 Stanley Tools, New Britain, Conn.
 Weiss & Co., H., New York City.
 Whitney Mfg. Co., W. A., Rockford, Ill.
 Whitney Metal Tool Co., Rockford, Ill.
 Wiedemann Machine Co., Philadelphia (Turret).

PUNCHES, POWER

PUNCHES, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss Co., E. W., Toledo, O.
Buffalo Forge Co., Buffalo.
Callahan Can Machine Co., Inc., Brooklyn.
Cleveland Punch & Shear Works, Co., Cleveland.
Engineering and Research Corporation, Riverdale, Md.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Henry & Wright Mfg. Co., Hartford, Conn.
New Albany Machine Mfg. Co., New Albany, Ind.

Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southinston, Conn.
Perkins Machine Co., Warren, Mass.
Royersford Foundry & Machine Co., Royersford, Pa.
Schatz Mfg. Co., Poughkeepsle, N. Y.
Service Machine Co., Elizabeth, N. J.
Streine Tool & Mfg. Co., New Bremen, O.
Swaine Mfg. Co., Fred J., St. Louis.

Verson Allsteel Press Co., Chicago.
Wales-Strippit Corporation, North Tonawanda, N. Y.
Weiss & Co., H., New York City.

Whitney Metal Tool Co., Rockford, Ill.
Wiedemann Machine Co., Philadelphia (Turret).
Zeh & Hahnemann Co., Newark, N. J.

QUADRANTS, DAMPER

See Regulators, Damper Sets

RECORDERS, HUMIDITY, PORTABLE

American Schaeffer & Budenberg Instrument Div., Manning. Maxwell & Moore, Inc., Bridgeport, Conn. Bristol Co., Waterbury, Conn. Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia. Foxboro Co., Foxboro, Mass. Friez Instrument Division, Towson, Md.

Friez Instrument Division, Towson, Md.
Leeds & Northrup Co., Philadelphis.
Marsh Corporation, Jas. P., Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Scientific Instrument Co., Detroit.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co. H. O. Detroit. Trerice Co., H. O., Detroit.

RECORDERS, TEMPERATURE, PORTABLE

American Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn.
Bailey Meter Company, Cleveland.
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co.,
Dbliddiphie. Philadelphia.

Defender Automatic Regulator Co., St. Louis. Foxboro Co., Foxboro, Mass. Friez Instrument Division, Towson, Md. Leeds & Northrup Co., Philadelphia. Marsh Corporation, Jas. P., Chicago. Mason-Neilan Regulator Co., Chicago.

Mason-Neilan Regulator Co., Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, New York City.
Palmer Co., Norwood, Cincinnati (mercury actuated).
Practical Instrument Co., Chicago.
Preferred Utilities Mfg. Corp., New York City.
Scientific Instrument Co., Detroit.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co. H. O. Detroit Trerice Co., H. O., Detroit. Weksler Thermometer Corp., New York City.

REFRACTORIES

Babcock & Wilcox Co., New York City.

Botfield Refractories Company, Philadelphia.
Chicago Fire Brick Co., Chicago.
Fireline Stove & Furnace Lining Co., Chicago (for Hearths and Firepot Linings). General Insulating Products Co., Brooklyn. Gilbert & Son, Harry E., Bridgeport, Conn. (Radiant). Green Fire Brick Co., A. P., Mexico, Mo. Johns-Manville, New York City (Cement and monolithic). Krehbiel Co., J. H., Chicago. Laclede-Christy Clay Products Co., St. Louis (Fire Clay). Ludowici-Celadon Co., Chicago.

McLeod & Henry Co., Inc., Troy, N. Y. (Silican Carbide).

Munn and Steele, Inc., Newark, N. J.

Plibrico Jointless Firebrick Co., Chicago (castable and plastic fire brick).

Preferred Utilities Mfg. Corp., New York City.

Pyrolite Products Co., Cleveland.

Quigley Company, Inc., New York City (Firebrick and Cements)

Ramtite Co., Chicago (Castable).

Refractory & Insulation Corp., New York City.

Rex Clay Products Co., Detroit.

Robinson Insulation Co., Great Falls, Mont.

Ruberiod Co., New York City.

Rutland Fire Clay Co., Rutland, Vt.

Standard Fuel Engineering Co., Detroit.

U. S. Stoneware Company, Akron, Ohio, and New York City.

Universal Zonolite Insulation Co., Chicago (Brick and Cement).

Walsh Refractories Corp., St. Louis. fire brick)

REGALVANIZING EQUIPMENT AND MATERIALS

Galv-Weld, Inc., Dayton, O.

REGISTER SEALS

See Seals for Registers

REGISTER SHIELDS

See Shields, Warm Air Register

REFRIGERATING UNITS

See Compressors, Refrigerating

REGISTERS, DIRECTIONAL FLOW

A-J Manufacturing Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich. Airo-Fin Grille Co., Detroit.
Auer Register Co., Cleveland.

Rarber-Colman Co., Rockford, Ill.
Char-Gale Mfg. Co., Minneapolis.
Davies Air Filter Corp., New York City.
Diamond Manufacturing Co., Wyoming, Pa.
Elsey Metal Specialties Co., Detroit.

Elsey Metal Specialties Co., Detroit.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gillian Mfg. Co., Detroit.
Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland.
Middleton Mfg. & Sales Co., Minneapolis.
Register & Grille Mfg. Co., Brooklyn.
Rock Island Register Co., Rock Island, Ill.
Standard Stamping & Perforating Co., Chicago.
Stewart Manufacturing Co., Orange, N. J.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Waterloo Register Co., Waterloo, Ia.

REGISTERS, HEATING AND VENTILATING

A-J Manufacturing Co., Kansas City, Mo. (Double Diffuser).

Air Control Products, Inc., Coopersville, Mich.
Airo-Fin Grille Co., Detroit.
Anemostat Corporation of America, New York City.

Auer Register Co., Cleveland.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee.
Davies Air Filter Corp., New York City.
Diamond Mfg. Co., Wyoming, Pa.
Empire Ventilation Equipment Co., Long Island City, N. Y.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Gillian Mfg. Co., Detroit.

Gillian Mfg. Co., Detroit.

Hart & Cooley Mfg. Co., Holland, Mich. Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland. Lamneck Products, Inc., Middletown, O. Middleton Mfg. & Sales Co., Minneapolis.
Mueller Furnace Co., L. J., Milwaukee. Register & Grille Mfg. Co., Inc., Brooklyn.
Rock Island Register Co., Rock Island, Ill. Standard Stamping & Perforating Co., Chicago. Stewart Manufacturing Co., Orange, N. J.
Tuttle & Bayley, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich. Waterloo Register Co., Waterloo, Ia. Wood Industries, Inc., Gar, Detroit.

REGULATORS, DAMPER SETS

REGULATORS, DAMPER SETS

Adams Company, The, Dubuque, Ia.
Air Control Products, Inc., Coopersville, Mich. Anemostat Corporation of America, New York City.
Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.
Cole-Sullivan Engineering Co., Minneapolis.
Fossum Mfg. Co., M. H., St. Paul, Minn.
Gerett Co., M. A., Milwaukee.
Goese Mfg. Co., Milwaukee.
Hart & Cooley Mfg. Co., Holland, Mich.
Joal Mfg. Corp., Toledo, O.
Kerentoff, G. L., Cincinnati.
Kieley & Mueller, Inc., North Bergen, N. J.
Mercold Corporation, Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Northern Weatherstrip Co., Duluth, Minn.
Ohlo Products Co., Cleveland.
Parker-Kalon Corp., New York City.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corporation, Milwaukee.
Sampsel Time Control, Inc., Spring Valley, Ill.
Trane Company, LaCrosse, Wis.
United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland.

REGULATORS, DRAFT, SMOKE PIPE

REGULATORS, DRAFT, SMOKE PIPE

Atlas Valve Company, Newark, N. J.
Campbell Engineering Co., Appleton, Wis. (Electric).
Cole-Sullivan Engineering Co., Minneapolis, Minn.
Defender Automatic Regulator Co., St. Louis.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Field Control Division, Mendota, Ill. (Barometric draft control).
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gold Seal Laboratories, Minneapolis (Automatic).
Harvey-Whipple, Inc., Springfield, Mass.
Hotstream Heater Co., Cleveland (Automatic).
James Regulator Co., Inc., Pottsville, Pa.
Kieley & Mueller, Inc., North Bergen, N. J.
Mason-Neilan Regulator Co., Dorchester, Mass.
Piatt Products Corporation, Lansing, Mich.
Polk Mfg. Co., Madison, Wis. (Combination).
Preferred Utilities Mfg. Corp., New York City.
Reading-Pratt & Cady Div., American Chain & Cable Co., Inc.,
Reading-Pratt & Co., Ford dy Leo, Wis. Reading, Pa.

Reading, Pa.
Simplex Mfg. Co., Fond du Lac, Wis.
Walker Mfg. & Sales Corp., St. Joseph, Mo.
Wheelco Instrument Co., Chicago.
Wisconsin Heating & Draft Control Co., Appleton,

REGULATORS, FURNACE DRAFT, MECHANICAL

REGULATORS, FURNACE DRAFT, MECHANICAL
Au-Temp-Co Corp., New York City.
Barber-Colman Co., Rockford, Ill.
Defender Automatic Regulator Co., St. Louis.
Fulton Sylphon Co., Knoxville, Tenn.
Gleason-Avery, Inc., Auburn, N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Hays Corp., Michigan City, Ind.
Little Janitor Furnace Clock Co., New York City.
Mercoid Corporation, Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Tem Products Co., Midland, Pa.
Timm & Son, P. C., Lincoln, Nebr.
Wisconsin Heating & Draft Control Co., Appleton, Wis.
(Electric). (Electric).

RELAYS, ELECTRICAL Advance Electric Co., Los Angeles. Allen-Bradley Co., Milwaukee. Allen-Bradley Co., Milwaukee.
American Instrument Co., Silver Spring, Md.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York City.
Automatic Switch Co., New York City.
Automatic Temperature Control Co., Inc., Philadelphia.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Benjamin Elec., Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland.
Consolidated Car-Heating Co., Inc., Albany, N. Y.
Cook Electric Co., Chicago.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn.
Cutier-Hammer, Inc., Milwaukee.
adex to Advertisers, page 314.

- Davis & Co., Inc., Dean W., Chicago.

 Detroit Lubricator Co., Detroit.
 Dunn, Inc., Struthers, Philadelphia.
 Durakool, Inc., Elkhart, Ind. (Mercury).
 Eastern Air Devices, Inc., Brooklyn.
 Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
 Friez Instrument Division, Towson, Md.
 General Controls Co., Glendale, Calif.
 General Electric Co., Schenectady, N. Y.
 Gleason-Avery, Inc., Auburn, N. Y.
 Guardian Electric Mfg. Co., Chicago.
 H-B Instrument Co., Inc., Philadelphia.
 Hart Mfg. Co., Hartford, Conn.
 Industrial Engineering Corp., Terre Haute, Ind.
 McCorkle Co., D. H., Berkeley, Calif.
 Mercoid Corp., Chicago.
 Minneapolis-Honeywell Regulator Co., Minneapolis.
 Monitor Controller Co., Baltimore.
 National Time & Signal Corp., Detroit.
 Penn Electric Switch Co., Goshen, Ind.
 Perfex Corp., Milwaukee.
 Philadelphia Thermometer & Instrument Co., Philadelphia.
 Precision Thermometer & Instrument Co., Philadelphia.

Philadelphia Thermometer Co., Philadelphia.
Precision Thermometer & Instrument Co., Philadelphia.
Small Motors, Inc., Chicago.
Spencer Thermostat Co., Attleboro, Mass.
Square D Co., Detroit.
Taylor Instrument Companies, Rochester, N. Y.
Triplex Mfg. Co., Peru, Ind.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Weston Electrical Instrument Corp., Newark, N. J.
White-Rodgers Electric Co., St. Louis.
Zenith Electric Co., Chicago.

REPAIRS, STOVE AND FURNACE

REPAIRS, STOVE AND FURNACE

Adams Company, The, Dubuque, Ia,
Associated Heater Parts Co., Chicago.
Banner Repair Parts Co., Youngstown, O.
Brauer Supply Co., A. G., St. Louis.
Central Furnace & Stove Repair Co., St. Louis.
Cincinnati Stamping Co., Cincinnati.
Clark Co., Henry N., Boston.
Cleveland Co-Operative Stove Co., Cleveland.
Des Moines Stove Repair Co., Des Moines, Ia.
Eselgroth & Co., Newark, N. J.
Faulitiess Heater Corp., Cleveland.
Foote Foundry Co., J. B., Fredericktown, O.
Homer Furnace & Foundry Corp., Coldwater, Mich.
Kramer Bros. Foundry Co., Dayton, O.
Livingston Repair, Marshall, Mich.
Manufacturers Successors, Inc., New York City.
Metzner Stove Repair Co., Kansas City, Mo.
Miller & Son, C. Arthur, Elmira, N. Y. (Furnace).
National Foundry & Furnace Co., Dayton, O.
Onthwestern Stove Repair Co., Chicago.
Omaha Stove Repair Works, Omaha, Neb.
Peerless Foundry Co., Indianapolis, Ind.
Peninsular Stove Co., Detroit.
Pittsburgh Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Portland, Me.
Shamblen Furnace Parts Co., Pittsburgh.
Portland Stove Foundry Co., Louisville, Ky.
Stove Manufacturing Corporation, Newark, N. J.
Tri-State Heating Supply Co., Fort Wayne, Ind.

RETINNING EQUIPMENT and MATERIALS

Retinning Manufacturing Co., Chicago.

RIDGE ROLLS AND RIDGING (METAL)

• American Rolling Mill Co., Middletown, O. (Galvanized).

RIDGE ROLLS AND RIDGING (MEIAL)

American Rolling Mill Co., Middletown, O. (Galvanized). Ames Co., W. R., San Francisco. Barnes Metal Products Co., Chicago. Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.

Berger Bros. Co., Philadelphia. Berger Mfg. Div. of Republic Steel Corp., Canton, O.

Bethlehem Steel Co., Bethlehem, Pa. (Metal). Biersach & Niedermeyer Co., Inc., Waterbury, Conn. Chicago Metal Mfg. Co., Chicago. Downs-Smith Brass & Copper Co., New York City. Edwards Mfg. Co., Inc., Cincinnati.

Hussey & Co., C. G., Pittsburgh (Copper). Klauer Mfg. Co., Dubuque, Ia. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis. Lamb & Ritchie Co., Cambridge, Mass. Lyon, Conklin & Co., Inc., Baltimore. Milcor Steel Co., Milwaukee. New Delphos Manufacturing Co., Delphos, O. Newport Rolling Mill Co., Newport, Ky. Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.

Osborn Co., J. M. & L. A., Cleveland. Reeves Steel & Mfg. Co., Dover, O. Riggin Metal Products, Inc., Kankakee, Ill. Ryniker Steel Products Company, Billings, Mont. St. Paul Corrugating Co., St. Paul, Minn. Schoedinger, F. O., Columbus, O. Sheet Metal Mfg. Co., Inc., Brooklyn. Southbridge Roofing Co., Inc., Brooklyn. Southbridge Roofing Co., Inc., Southbridge, Mass. Southern States Iron Roofing Co., Savannah, Ga.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Tennessee Coal, from & Railroad Co., Birmingh Tiffin Eaves Trough Clamp Co., Tiffin, O. Van Noorden Co., E., Boston. Wheeling Corrugating Co., Wheeling, W. Va. Williams-Wallace Co., San Francisco. Woolwine Metal Products Co., Los Angeles. Youngstown Sheet & Tube Co., Youngstown, O.

RIDGE VENTILATORS

See Ventilators, Roof, Ridge

RIVETS, ALLOY

Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.

Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Milidale, Conn.
General Plate Div. Metals & Controls Corp., Attleboro, Mass.
Hassall, Inc., John, Brooklyn.
National Screw & Mfg. Co., Cleveland.
Republic Steel Corp., Cleveland.
Towsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, ALUMINUM

Aluminum Company of America, Pittsburgh.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Bridgeport Screw Co., Bridgeport, Conn.
Cherry Rivet Co., Los Angeles (Blind).
Chicago Rivet & Machine Co., Bellwood, Ill.
Continental Screw Co., New Bedford, Mass.
du Pont de Nemours & Co., E. I., Wilmington, Del. (Explosive).
Hassall, Inc., John, Brooklyn.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, BRASS, COPPER AND IRON

Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. Blake & Johnson Co., Waterville, Conn. Bridgeport Screw Co., Bridgeport, Conn. Bridgeport Screw Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Chicago Rivet & Machine Co., Bellwood, Ill.
Clendenin Brothers, Inc., Baltimore (Brass, Copper).
Conklin Brass & Copper Co., Inc., T. E., New York City.
Continental Screw Co., New Bedford, Mass.
Downs-Smith Brass & Copper Co., New York City.
Hassall, Inc., John, Brooklyn.
Hussey & Co., C. G., Pittsburgh.
National Screw & Mfg. Co., Cleveland.
Taunton & Company, Inc., John H., New York City.
Townsend Co., New Brighton, Pa.
Tubular Rivet & Stud Co., Wollaston, Mass.

RIVETS, STEEL

Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. Atlantic Steel Company, Atlanta, Ga. Atlas Bolt & Screw Co., Cleveland. Bethlehem Steel Co., Bethlehem, Pa. Chicago Rivet & Machine Co., Bellwood, Ill. Clark Bros. Bolt Co., Milidale, Conn. National Screw & Mfg. Co., Cleveland. Republic Steel Corporation, Cleveland. Townsend Co., New Brighton, Pa. Tubular Rivet & Stud Co., Wollaston, Mass.

ROD, GAS WELDING

Air Reduction Sales Co., New York City. American Brass Co., Waterbury, Conn. American Steel & Wire Co., Cleveland. American Brass Co., Waterbury, Conn.
American Steel & Wire Co., Cleveland.
Atlantic Steel Company, Atlanta, Ga.
Bastian-Blessing Co., Chicago.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Crucible Steel Co. of America, New York City (Stainless).
Duraloy Co., Scottsdale, Pa. (Stainless).
Eutectic Welding Alloys Company, New York City.
Imperial Brass Mfg. Co., Chicago.
International Nickel Co., Inc., New York City (Monel).
Linde Air Products Co., The, New York City.
Marquette Mfg. Co., Inc., Minneapolis.
Maurath, Inc., Cleveland.
Milburn Co., Alexander, Baltimore.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Page Steel & Wire Div., Monessen, Pa. (Stainless Steel).
Republic Steel Corporation, Cleveland.
Revere Copper and Brass Incorporated, New York City.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Corp., San Francisco.
Wickwire Spencer Steel Co., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS

See Bearings, Roller

ROOFING, ALUMINUM

Air-O-Cel Industries, Inc., Detroit. Fingles Co., The, Baltimore.

ROOFING. BUILT-UP

Air-O-Cei Industries, Inc., Detroit, Barber Co., Inc., Philadelphia, Barrett Division, Allied Chemical & Die Corporation, New York

City.

Bird & Son, Inc., East Walpole, Mass.
Cabot, Inc., Samuel, Boston.
Carey Co., Philip, Lockland, O.
Certain-teed Products Corp., New York City.
Detroit Steel Products Co., Detroit. Flintkote Co., New York City.
Ford Roofing Products Co., Chicago.
Johns-Manville, New York City.
Koppers Co., Pittsburgh (Pitch and Felt). Koppers Co., Pittsburgh (Pitch and Felt).
Lehon Company, Chicago.
Logan-Long Co., Chicago.
National Mfg. Corp., Tonawanda, N. Y.
Nelson Mfg. Co., B. F., Minneapolis.
Reilly Tar & Chemical Corp., Indianapolis.
Robertson Co., H. H., Pittsburgh.
Ruberoid Co., New York City.
Southport Paint Co., Savannah, Ga.
Luited States Gynsum Co., Chicago. United States Gypsum Co., Chicago.

ROOFING, COPPER

American Brass Co., Waterbury, Conn.
Braden Mfg. Co., Terre Haute, Ind.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Copper Roofs Corp., Milwaukee.
Downs-Smith Brass & Copper Co., New York City.
Edwards Mfg. Co., Inc., Cincinnatl.
Fingles Co., The, Baltimore.

Hussey & Co., C. G., Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
National Brass & Copper Co., Inc., Lisbon, O.
New Haven Copper Co., Seymour, Conn.
Perkinson & Brown, Chicago.
Revere Copper and Brass Incorporated, New York City.

ROOFING, IRON

◆ American Rolling Mill Co., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Byers Co., A. M., Pittsburgh (Wrought Iron).
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
International Steel Company, Evansville, Ind.
New Delphos Manufacturing Co., Delphos, O.
Republic Steel Corp., Cleveland.
Southern States Iron Roofing Co., Savannah, Ga.

◆ Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Eaves Trough Clamp Co., Tiffin, O.

ROOFING, LEAD

Alpha Metal & Rolling Mills, Inc., Brooklyn.

• American Smelting and Refining Co., New York City.
Andrews Lead Co., Inc., Long Island City.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Copper Roofs Corporation, Milwaukee.
Eagle-Picher Lead Co., Cincinnati.
Fingles Co., The, Baltimore.
Flemm Lead Co., Inc., Long Island City, N. Y.
Illinois Zinc Co., Chicago.
National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash.
Rochester Lead Works, Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn.

ROOFING, SLATE

Barrett Division, Allied Chemical & Die Corp., New York City (Slate Surfaced Shingles and Rolls).
Jackson-Bangor Slate Co., Pen Argyl, Pa.
North Bangor Slate Co., Bangor, Pa.
Norton Brothers, Granville, N. Y.
Perkinson & Brown, Chicago. Rising & Nelson Slate Co., West Pawlet, Vt.
Sheldon Slate Products Co., Inc., Cranville, N. Y. (Colors).
Structural Slate Co., Pen Argyl, Pa.
Vendor Slate Co., Inc., Nazareth, Pa. Vermont Structural Slate Co., Inc., Fair Haven, Vt.

ROOFING, STEEL

• American Rolling Mill Co., Middletown, O.
American Steel Band Co., Pittsburgh.
Apollo Steel Company, Apollo, Pa.
Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
Berger Mfg. Div. Republic Steel Corp., Canton, O.

• Bethlehem Steel Co., Bethlehem, Pa.
• Carnegle-Illinois Steel Corp., Pittsburgh.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
• Columbia Steel Co., Sub. U. S. Steel Corp., San Francisco.
• Continental Steel Corp., Kokomo, Ind.
Detroit Steel Products Co., Detroit.

Edwards Manufacturing Co., Inc., Cincinnati. Globe Iron Roofing & Corrugating Co., Newport, Ky. Globe Iron Roofing & Corrugating Co., Newport, Ky.
Inland Steel Company, Chicago.
International Steel Company, Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh.
Klauer Manufacturing Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Milcor Steel Co., Milwaukee.
New Delphos Manufacturing Co., Delphos, O.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Perkinson & Brown, Chicago.
Reeves Steel & Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland.
Robertson Co., H. H., Pittsburgh.
St. Paul Corrugating Co., St. Paul, Minn.
Southern States Iron Roofing Co., Savannah, Ga.
Superior Sheet Steel Co. Div. Continental Steel Corp., Canton, O.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tiffin Eaves Trough Clamp Co., Tiffin, O.
Truscon Steel Co., Youngstown, O.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corporation, Wheeling, W. Va.

ROOFING, TERNE PLATE

Berger Mfg. Div., Republic Steel Corp., Canton, Ohio, Bethlehem Steel Co., Bethlehem, Pa. Carnegie-Illinois Steel Corp., Pittsburgh. Cincinnati Sheet Metal & Roofing Co., Cincinnati. Foliansbee Steel Corporation, Pittsburgh, 30. Klauer Manufacturing Co., Dubuque, Ia. Milcor Steel Co., Milwaukee. New Delphos Manufacturing Co., Delphos, O. New Delphos Manufacturing Co., Delphos, C. Republic Steel Corp., Cleveland. Southern States Iron Roofing Co., Savannah, Ga. Tiffin Eaves Trough Clamp Co., Tiffin, O. Wheeling Corrugating Company, Wheeling, W. Va. Wheeling Metal & Mfg. Co., Moundsville, W. Va. Wheeling Steel Corp., Wheeling, W. Va. Youngstown Sheet & Tube Co., Youngstown, O.

ROOFING, TILE (CLAY & CONCRETE)

Hood Co., B. Mifflin, Daisy, Tenn. (Clay). Ludowici-Celadon Co., Chicago. Murray Tile Co., Cloverport, Ky. National Fireproofing Corp., Pittsburgh. Perkinson & Brown, Chicago. Truscon Laboratories, Detroit. United States Gypsum Co., Chicago.

ROOFING, TIN

Berger Mfg. Div. of Republic Steel Corp., Canton, O. Carnegle-Illinois Steel Corp., Pittsburgh. Cincinnati Sheet Metal & Roofing Co., Cincinnati, O. Foliansbee Steel Corporation, Pittsburgh. Klauer Manufacturing Co., Dubuque, Ia. Milcor Steel Co., Milwaukee, Wis. New Delphos Manufacturing Co., Delphos, O. Perkinson & Brown, Chicago. Republic Steel Corp., Cleveland, O. Southern States Iron Roofing Co., Savannah, Ga. Wheeling Corrugating Co., Wheeling, W. Va. Wheeling Steel Corp., Wheeling, W. Va.

ROOFING, ZINC

American Zinc Products Co., Greencastle, Ind.
Barnes Metal Products Co., Chicago.
Edwards Mfg. Co., Inc., Cincinnati.
Hegeler Zinc Company, Danville, Ill.
Illinois Zinc Co., Chicago.
Matthiessen & Hegeler Zinc Co., La Salie, Ill.
New Jersey Zinc Co., New York City.
Southern States Iron Roofing Co., Savannah, Ga.
Wheeling Corrugating Co., Wheeling, W. Va. (Coated).
Wheeling Steel Corp., Wheeling, W. Va. (Coated).

RUST PROTECTION FOR METALS See Chemicals, Rust Preventive

SAFETY GLASS

See Glass, Safety

SANDERS See Buffers, Grinders, Polishers and Sanders

SAVERS, HEAT

Barclay, Inc., Robert, Chicago. Barclay. Inc., Robert, Chicago.
Cary Mfg. Co., Waupaca, Wis.
Condensation Engineering Corp., Chicago.
Crown Fuel Saver Co., Richmond, Ind.
Gerhardt, W. F., Richmond, Va. (oil or gas).
Harvey-Whipple, Inc., Springfield, Mass.
Kewanee Boiler Corporation, Kewanee, Ill.

• Leader Iron Works, Inc., Decatur, Ill.
Meyers Fuel Saver Co., Inc., Janesville, Wis.
Reynolds Electric Co., Chicago.
Woolery Machine Co., Minneapolis, Minn.

SAWS, BAND, SHEET METAL CUTTING

Atkins and Co., E. C., Indianapolis.
Barnes, W. O., Detroit.
Continental Machines Incorporated, Minneapolis (Rotary).
Doall Company, Des Plaines, Ill.
Grob Brothers, Grafton, Wis.
Disston & Sons, Inc., Henry, Tacony Sta., Philadelphia.
Racine Tool & Machine Co., Racine, Wis.
Skilsaw, Inc. Chicago.

Skilsaw, Inc., Chicago.
 Tannewitz Works, Grand Rapids, Mich.
 Wells Mfg. Corp., Three Rivers, Mich.

SAWS, HACK, POWER.

Atkinson and Co., E. C., Indianapolis.
Champion Blower & Forge Co., Lancaster, Pa.
Clemenson Bros., Inc., Middletown, N. Y.
Disston & Sons, Inc., Henry, Tacony Sta., Philadelphia. Johnson Manufacturing Corporation, Albion, Mich. (Wet for high speed).

Racine Tool & Machine Co., Racine, Wis.

Robertson, F. L., Buffalo. Royersford Foundry & Machine Co., Royersford, Pa. Syntron Co., Homer City, Pa. (Electric, semi-portable). Wells Manufacturing Corp., Three Rivers, Mich.

SCREENS, SUN REFLECTING

Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.

SCREWS, DRIVE

American Screw Co., Providence, R. I.
Anti-Corrosive Metal Products Co., Inc., Albany, N. Y.
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corp., New Britain, Conn.
Elco Tool & Screw Corporation, Rockford, Ill.
Hassall, Inc., John, Brooklyn.
Hillwood Manufacturing Co., Cleveland.
National Lock Co., Rockford, Ill.
National Screw & Mfg. Co., Cleveland.
Parker-Kalon Corp., New York City (Hardened Metallic).
Pheoli Manufacturing Co., Chicago.
Townsend Co., New Brighton, Pa.
Turner & Seymour Mfg. Co., Torrington, Conn.

SCREWS, FEED, STOKER

Bros Boiler & Mfg. Co., Wm., Minneapolis.
Burnside Steel Foundry Co., Chicago.
Chicago Steel Foundry Co., Chicago.
Davy Fuel & Supply Co., Stoker Div., Detroit.
Farrell-Cheek Steel Co., Stoker Parts Div., Sandusky, O.
Wyoming Stoker Worm Co., Wyoming, Pa.

SCREWS, SELF-TAPPING

American Screw Co., Providence, R. 1.
Anti-Corrosive Metal Products Co., Inc., Albany,
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.
Eleo Tool & Screw Corporation, Rockford, Ill.
National Lock Co., Rockford, Ill.
National Screw & Mfg. Co., Cleveland.

Parker-Kalon Corp., New York City.
Pheoll Manufacturing Co., Chicago.
Shakeproof, Inc., Chicago.

United States Register Co., Battle Creek, Mich. Albany, N. Y.

SCREWS, SHEET METAL

Aluminum Co. of America, Pittsburgh (Aluminum). American Screw Co., Providence, R. I. Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. (Stain-

Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.
Eleo Tool & Screw Corporation, Rockford, Ill.
National Lock Co., Rockford, Ill.
National Screw & Mfg. Co., Cleveland.
Parker-Kalon Corp., New York City.
Pheoll Manufacturing Co., Chicago.
Shakeproof, Inc., Chicago.

Townsend Co., New Brighton, Pa.

United States Register Co., Battle Creek, Mich.

SEALS for REGISTERS

• Excel Heating & Air Conditioning Co., Chicago.

SEAMER MACHINES See Machines, Seaming

SETTING DOWN MACHINES

See Machines, Setting Down

SHEARS, CIRCLE, HAND

Crescent Tool Co., Jamestown, N. Y.
Niagara Machine & Tool Works, Buffalo.

Peck, Stow & Wilcox Co., Southington, Conn.
Wiss & Sons Co., J., Newark, N. J.

SHEARS, CIRCLE, POWER

Libert Machine Co., Green Bay, Wis.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Whiting Corp., Quickwork Div., Harvey, Ill.
Wysong & Miles Co., Greensboro, N. C.
Yoder Company, Cleveland.

SHEARS, HAND AND BENCH

See Snips and Shears, Bench and Hand

SHEARS AND PUNCHES COMBINED

See Punches and Shears Combined

SHEARS, ELECTRIC, PORTABLE

Black & Decker Mfg. Co., Towson, Md.
C-B Tool Co., Lancaster, Pa. (Cutting Head only).
G. D. S. Machinery & Supply Co., New York City.
Independent Pneumatic Tool Co., Chicago.
O'Neil-Irwin Manufacturing Co., Minneapolis.
Stanley Electric Tool Div., The Stanley Works, New Britain.
Conn.

Conn. Van Dorn Electric Tool Co., Towson, Md. York Electric and Machine Company, York, Pa.

SHEARS, ROTARY, SLITTING, HAND

Marshalltown Manufacturing Co., Marshalltown, Ia.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn. Rafter Machine Co., Belleville, N. J. Wagner, C. DeWitt, Cedar Rapids, Ia.

SHEARS, SQUARING, FOOT

Barth Mfg. Co., Piantsville, Conn.
Bertsch & Co., Cambridge City, Ind.
Niagara Machine & Tool Works, Buffalo.
Peck, Stow & Wilcox Co., Southington, Conn.
Royersford Foundry & Machine Co., Royersford, Pa.

SHEARS, SQUARING, POWER

Beatty Machine & Mfg. Co., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Bliss & Co., E. W., Toledo, O.
Cincinnati Shaper Co., Cincinnati.
Cleveland Punch & Shear Works Co., Cleveland.
Excelsior Tool and Machine Co., East St. Louis, Ill.
Niagara Machine & Tool Works, Buffalo.
O'Neil-Irwin Manufacturing Co., Minneapolis.
Peck, Stow & Wilcox Co., Southington, Conn.
Streine Tool & Mfg. Co., New Bremen, O.
Whitney Metal Tool Company, Rockford, Ill.

SHEET METAL PARTS

See Mouldings and Trim; also Stampings, Metal

SHEETS, ALUMINUM

Aluminum Company of America, Pittsburgh. American Nickeloid Company, Peru, Ill. Fairmont Aluminum Co., Fairmont, W. Va.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
Aluminum Company of America, Pittsburgh.
American Nickeloid Company, Peru, Ill. (Nickel, Chromium, Brass, Copper).

Brass, Copper).

Cheney Metal Products Co., Trenton, N. J.

Continental Steel Corp., Kokomo, Ind. (Lead).
General Plate, Div. Metals & Controls Corp., Attleboro, Mass.
Granite City Steel Company, Granite City, Ill.
Ingersoll Steel & Disc Div. Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa. (Stainless).
Lamb & Ritchie Co., Cambridge, Mass. (Lead).
Lukens Steel Co., Coatesville, Pa.

SHEETS, COPPER

American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Conklin Brass & Copper Co., Inc., T. E., New York City.
Downs-Smith Brass & Copper Co., Inc., New York City.

Hussey & Co., C. G., Pittsburgh.

• Advertisement in this issue. See Index to Advertisers, page 314.

944

National Brass & Copper Co., Inc., Lisbon, O. New Haven Copper Co., Seymour, Conn. Revere Copper and Brass Incorporated, New York City. U. S. Brass & Copper Co., Hyde Park, Mass. Western Cartridge Co., East Alton, Ill. (Brass, Bronze, Phosphor, Propre)

SHEETS, COPPER, LEAD COATED

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
Downs-Smith Brass & Copper Co., New York City.

Downs-Smith Brass & Copper Co., New York City.

Hussey & Co., C. G., Pittsburgh.
Lamb & Ritchie Co., Cambridge, Mass.
Ledcote Products Co., Long Island City, N. Y.
National Brass & Copper Co., Inc., Lisbon, O.
New Haven Copper Co., Seymour, Conn.
Revere Copper & Brass Incorporated, New York City.
U. S. Brass & Copper Co., Hyde Park, Mass.

SHEETS, GALVANNEALED

· Carnegie-Illinois Steel Corp., Pittsburgh. Continental Steel Corp., Kokomo, Ind.
 Republic Steel Corp., Cleveland.
 Sharon Steel Corp., Sharon, Pa.
 Superior Sheet Steel Co., Canton, O.

SHEETS, LEAD

Alpha Metal & Rolling Mills, Inc., Brooklyn.

American Smelting and Refining Co., New York City. Andrews Lead Co., Inc., Long Island City, N. Y. Belmont Smelting & Refining Works, Inc., Brooklyn. Down-Smith Brass & Copper Co., Inc., New York City. Eagle-Picher Lead Co., Cincinnati. Flemm Lead Co., Inc., Long Island City, N. Y. Illinois Zinc Co., Chicago.

Lissberger & Son., Inc., Marks, Long Island City, N. Y. National Lead Co., New York City.
Northwest Lead Company, Seattle, Wash. Rochester Lead Works, Rochester, N. Y. Standard Rolling Mills, Inc., Brooklyn.

Weirton Steel Co., Weirton, W. Va. (Alloy Coated).

SHEETS, MAGNESIUM ALLOY

Dow Chemical Co., Midland, Mich.

SHEETS, MONEL

International Nickel Company, Inc., New York City.

SHEETS, SPECIAL METAL

(Nickel Zinc, Chrome Zinc, Nickel Coated Copper, Chromium Coated Copper, Nickel Coated Steel, Chromium Coated Steel, Chromium Coated Nickel Silver, Zinc Brass, Zinc Copper, etc.)

Allegheny Ludlum Steel Corp., Brackenridge, Pa

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
American Brass Co., Waterbury, Conn. (Copper-Silicon Alloys).
American Nickeloid Co., Peru, Ill.
Apollo Metal Works, Chicago (Nickel Zinc, Chrom Zinc, Nickel
Copper, Chrom Copper, Chrom Steel, Nickel Steel, Nickel Tin,
Chrom Tin).
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
(Muntz Metal, Nickel Silver, Phosphor Bronze).
Duriron Company, Inc., Dayton, O.
Hussey & Co., C. G., Pittsburgh.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Lyon, Conklin & Co., Inc., Baltimore.
Maysteel Products, Inc., Mayville, Wis.
National Sheet Metal Co., Peru, Ill.
Republic Steel Corp., Cleveland.
Western Cartridge Co., East Alton, Ill. (Non Ferrous).

SHEETS, STAINLESS

Allegheny Ludlum Steel Corp., Brackenridge, Pa.

Allegheny Ludlum Steel Corp., Brackenridge, Pa.

American Rolling Mill Co., Middletown, O.
Barium Stainless Steel Corp., Canton, O.
Carnegie-Illinois Steel Corp., Pittsburgh.
Colonial Alloys Co., Philadelphia.
Crucible Steel Co. of America, New York City (Two-Ply).
Eastern Rolling Mill Co., Baltimore.
Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Jessop Steel Co., Washington, Pa.
Republic Steel Corp., Cleveland.
Sharon Steel Corp., Sharon, Pa.
Superior Steel Corp., Pittsburgh.
Universal-Cyclops Steel Corp., Bridgeville, Pa.

SHEETS, STEEL

(Polished and Blue, Corrugated and Plain, Black, Terne and Galvanized)

American Rolling Mill Co., Middletown, O.
 American Steel & Wire Co., Cleveland (Galvanized).

Apollo Steel Co., Apollo, Pa.

Bethlehem Steel Co., Bethlehem, Pa.
Carnegle-Illinois Steel Corp., Pittsburgh.
Columbia Steel Co., San Francisco.
Continental Steel Corp., Kokomo, Ind.
Crucible Steel Company of America, New York City.
Empire Sheet & Tin Plate Co., Mansfield, O.
Follansbee Steel Corporation, Pittsburgh 30.
Granite City Steel Co., Granite City, Ill.
Great Lakes Steel Corporation, Detroit.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Lukens Steel Co., Coatesville, Pa.
Lyon, Conklin & Co., Inc., Baltimore.
Newport Rolling Mill Co., Newport, Ky.
Niles Rolling Mill Co., Niles, O.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Reeves Steel & Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O. (Galvanized, Hot Rolled and Long Ternes).
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Welrton Steel Corp., Wheeling, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Whoeling Steel Company, Alan, Conshohocken, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, COPPER BEARING

SHEETS, STEEL, COPPER BEARING

American Rolling Mill Co., Middletown, O.
Bethlehem Steel Co., Bethlehem. Pa.
Carnegie-Illinois Steel Corp., Pittsburgh.
Columbia Steel Co., San Francisco.
Continental Steel Corp., Kokomo. Ind.
Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago.
Lukens Steel Co., Coatesville, Pa.
Newport Rolling Mill Co., Newport, Ky.
Reeves Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland.
Sharon Steel Co., Sharon, Pa.
Superior Sheet Steel Co., Canton, O.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, TIN PLATE

Belmont Smelting & Refining Works, Inc., Brooklyn.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegle-Illinois Steel Corp., Pittsburgh.
Crucible Steel Company of America, New York City.
Follansbee Steel Corporation, Pittsburgh.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh (Tinned).
Lyon, Conklin & Co., Inc., Baltimore.
Republic Steel Corp., Cleveland.
Rochester Lead Works, Inc., Rochester, N. Y.
Sharon Steel Corp., Sharon, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, ZINC

American Nickeloid Co., Peru, Ill.
American Zinc Products Co., Greencastle, Ind.
Belmont Smelting & Refining Works, Inc., Brooklyn.
Downs-Smith Brass & Copper Co., Inc., New York City.
Hegeler Zinc Co., Danville, Ill.
Illinois Zinc Co., Chicago.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York City.

SHIELDS, WARM AIR REGISTER

Gammeter Co., W. F., Cadiz, O. (With Humidifier).
Kauffman Air Conditioning Corp., St. Louis.
Marshallan Mfg. Co., Cleveland.
Patent Novelty Company, Fulton, Ill. (With humidifier).
Pentecost & Craft Co., Terra Haute, Ind.
Schoedinger, F. O., Columbus, O.

SHINGLES AND TILE, METAL

Ames Company, W. R., San Francisco. Cincinnati Sheet Metal & Roofing Co., Cincinnati. Edwards Manufacturing Co., Inc., Cincinnati. Fingles Co., The, Baltimore. Fingles Co., The, Baltimore.

Globe Iron Roofing & Corrugating Co., Newport, Ky. (galvanized and painted terne).

Herbert & Sons, T. L., Nashville, Tenn.

Miller & Doing, Brooklyn.

New Haven Copper Co., Seymour, Conn. (Copper).

Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo. · Advertisement in this issue. See Index to Advertisers, page 314.

Reeves Steel & Mfg. Co., Dover, O. (Galvanized).
Sheet Metal Mfg. Co., Inc., Brooklyn.
Southern States Iron Roofing Co., Savannah, Ga.
• Tenessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galv.

Tiffin Eaves Trough Clamp Co., Tiffin, O.
Wheeling Corrugating Co., Wheeling, W. Va. (steel shingles).
Williams-Wallace Co., San Francisco (Painted tin and galv.).

SHRINKING MACHINES

See Machines, Shrinking

SHUTTERS

See Louvres and Shutters

SHUTTERS & DOORS, FIRE

See Doors and Shutters, Fire

SKYLIGHT LIFTS

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nized

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See Lifts, Skylight

SKYLIGHTS

SKYLIGHTS

Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa. American Sheet Metal Works, New Orleans, La. Anderson Mfg. Co., Des Moines, Ia. Beatrice Steel Tank Mfg. Co., Beatrice, Nebr. Biersach & Niedermeyer Co., Milwaukee. Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati. Danzer Metal Works Co., Hagerstown, Md. Edwards Mfg. Co., Inc., Cincinnati.
Falstrom Co., Passale, N. J. Fingles Co., The, Baltimore.
Gehri Company, Tacoma, Wash.
General Sheet Metal Works, Inc., Bridgeport, Conn. (Puttyless). Herbert & Sons, T. L., Nashville, Tenn.
Hirschman Co., Inc., W. F., Buffalo.
International Steel Co., Evansville, Ind.
Klauer Mfg. Co., Dubuque, Ia.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis. Lee & Son Co., Thomas, Cincinnati.
Main Cornice Works, Los Angeles.
Mesker & Co., Geo. L., Evansville, Ind.
Midwest Aluminum Products, Inc., Milwaukee.
Moeschi-Edwards Corrugating Co., Inc., Cincinnati.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Northern Furnace & Supply Co., Billings, Mont.
Perkinson & Brown, Chicago.
Riester & Thesmacher Co., Cleveland.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H., Pittsburgh (Structural).
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Southbridge Roofing Co., Inc., Southbridge, Mass.
Steinhorst & Sons, Inc., Emil, Utica, N. Y.
Van Noorden Co., E., Boston.
Vent-O-Lite Co., Chicago (Ventilating, Industrial, Puttyless).
Ward Co., H. H., Chester, Pa.
Willis Steel Corporation, Galesburg, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.
York Corrugating Co., York, Pa.

SLEEVE BEARINGS

See Bearings, Sleeve

SLITTING MACHINES

See Machines, Slitting

SMOKE PIPE

See Pipe, Smoke

SNIPS AND SHEARS, BENCH AND HAND

Armstrong-Blum Mfg. Co., Chicago.

Armstrong-Blum Mfg. Co., Chicago.
Bartlett Mfg. Co., Detroit.
Bergman Tool Mfg. Co., Buffalo (Bench).

Beverly Shear Co., Chicago.

Bremil Mfg. Co., Erie, Pa. (Shears).
Class Shear Co., Freemont, O. (hand).
Compton Shear Co., W. H., Newark, N. J.

Crescent Tool Co., Jamestown, N. Y.
G. D. S. Machinery & Supply Co., New York City.
Grobet File Corp. of America, New York City.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Klenk's Aviation Snips, Wilmington, Del.

Niagara Machine & Tool Works, Buffalo.
O'Neil-Irwin Manufacturing Co., Minneapolis.
Packham Crimper Company, Mechanicsburg, O. (Rotary Snips).

Penn Tool Company, Philadelphia.
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Snap-On Tools Corporation, Kenosha, Wis.
Viking Shear Co., Erie, Pa. (Shears).

Advertisement in this issue. S

SNOW GUARDS

See Guards, Snow

SOLDER.

Air Reduction Sales Co., New York City.

• Allen Co., Inc., L. B., Chicago. (Aluminum and Stainless Steel).

Alpha Metal & Rolling Mills, Inc., Brooklyn (Silver & Tin-Lead).

American Brass Co., Waterbury, Conn.

American Smelting & Refining Co., New York City (Lead-Silver

and Silver).

American Solder & Flux Co., Philadelphia (paste).

Andrews Lead Co., Inc., Long Island City, N. Y.

Belmont Smelting & Refining Works, Inc., Brooklyn (all kinds).

Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Conklin Brass & Copper Co., Inc., T. E., New York City.

Downs-Smith Brass & Copper Co., New York City.

Eagle-Picher Lead Co., 'Cincinnati (Bar and Wire).

Eastern States Supply Co., Brooklyn.

Empire Metal Co., Syracuse, N. Y.

Farrelloy Company, Inc., Philadelphia.

Flemm Lead Co., Inc., Long Island City.

Gardiner Metal Co., Chicago.

Glaser Lead Co., Inc., Brooklyn.

Flemm Lead Co., Inc., Long Island City.
Gardiner Metal Co., Chicago.
Glaser Lead Co., Inc., Brooklyn.
Handy & Harman, New York City (silver).
Industrial Service Laboratories, Milwaukee.
Jiggers, Inc., Chicago (Kit).
Johnson Co., Lloyd S., Chicago.
Johnston Tin Foll & Metal Co., St. Louis.
Kester Solder Co., Chicago (Bar, Solid, Self-Fluxing Wire).
Klauer Mfg. Co., Dubuque, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
Lukens Metal Co., Thos. F., Philadelphia.
Merchant & Evans Co., Philadelphia.
Merchant & Evans Co., Philadelphia.
Motex Metal Process Corporation, Detroit.
National Lead Co., New York City.
New Delphos Manufacturing Co., Delphos, O.
Northwest Lead Company, Seattle, Wash.

Ruby Chemical Co., Columbus, O. (Acld and Rosin Core).
Ryerson & Son., Inc., Joseph T., Chicago.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Standard Rolling Mills, Inc., Brooklyn.

SOLDERING COPPERS

See Coppers, Soldering

SOLDERING FLUX

See Flux, Soldering

SOLDERING FURNACES

See Furnacea, Soldering

SOLDERING IRONS

See Coppers, Soldering

SOLDERING TORCHES

See Torches, Soldering

SOLENOID VALVES

See Valves, Solenoid

SOUND LEVEL INDICATORS

See Indicators, Sound Level

SPOT WELDERS

See Welders, Spot

SPRAY GUNS

See Guns, Spray

SQUARING MACHINES

See Machines, Squaring

STAMPINGS, METAL

Ackermann Manufacturing Company, Wheeling, W. Va. Ames Co., W. R., San Francisco. Anti-Corrosive Metal Products Co., Inc., Albany, N. Y. Bossert Company, Inc., Utica, N. Y. Burgess-Norton Mfg. Co., Geneva, Ill. Chase Brass & Copper Co., Incorporated, Waterbury, Conn. Chicago Metal Mfg. Co., Chicago (Rings). Commercial Shearing & Stamping Co., Youngstown, O. Dahlstrom Metallic Door Co., Jamestown, N. Y. Dayton Rogers Mfg. Co., Minneapolis. Detroit Stamping Co., Detroit. Edwards Mfg. Co., Inc., Cincinnati. Friedley-Voshardt Co., Chicago. General Blower Corp., San Francisco. General Metal Products Co., St. Louis. Index to Advertisers, page 314. Ackermann Manufacturing Company, Wheeling, W. Va.

Gerock Bros. Mfg. Co., St. Louis.
Geuder, Paeschke & Frey Co., Milwaukee.
Gillin Mfg. Co., Detroit.
Globe Machine & Stamping Co., Cleveland.
Grammes & Sons, Inc., L. F., Allentown, Pa.
H P L Manufacturing Co., Cleveland.
Kirk & Blum Mfg. Co., Cincinnati.
Lukens Steel Company, Coatésville, Pa.
Maysteel Products, Inc., Mayville, Wis.
Miller & Doing, Brooklyn.

Morrison Products, Inc., Cleveland.
Morrison Products, Inc., Buffalo.
Mullins Mfg. Co., Warren, O.
National Manufacturing & Engineering Co., Detroit.
New Delphos Manufacturing Co., Delphos, O.
New Monarch Machine & Stamping Co., Des Moines, Ia.
Niles Steel Products Div., Republic Steel Corp., Niles, O.
Osborn Co., J. M. & L. A., Cleveland, O.
Revere Copper and Brass Incorporated, New York City.
Schwitzer-Cummins Company, Indianapolis.
Service Machine Co., Elizabeth, N. J.
Standard Pressed Steel Co., Jenkintown, Pa.
Standard Stamping & Perforating Co., Chicago.
Tannewitz Works, Grand Rapids, Mich.
United States Register Co., Battle Creek, Mich.
Waterman-Waterbury Co., Minneapolis.
Western Cartridge Company, East Alton, Ill.
Worcester Pressed Steel Co., Worcester, Mass.

STAMPINGS, STEEL FURNACE

Ackermann Manufacturing Company, Wheeling, W. Va. Commercial Shearing & Stamping Co., Youngstown, O. (Flanged and Dished Heads for Furnace Domes, Radiator Crescent Heads, Hat Pipes).

> STEEL FRAMING See Framing, for Housing Assemblies

> > STOKER CONTROLS See Controls, Stoker

> > > STOKER DRIVES See Drives, Stoker

STOKER SCREWS OR WORKS See Screws, Feed, Stoker

STOKERS, DOMESTIC

(Up to 61 lb. per hr.)

(Up to 61 lb. per hr.)

Advance Appliance Co., Inc., Peoria, Ill.
Air Conditioning & Stokers, Inc., St. Louis.
American Furnace Co., St. Louis.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Automatic Stoker Corp., Indianapolis.
Bardes Range & Foundry Co., E. H., Cincinnatl.
Beckley Perforating Co., Garwood, N. J. (Anthracite).
Black Servant Stoker Co., St. Louis.
Blufiton Mfg. Co., Findlay, O.
Bovee Furnace Works, Waterloo, Ia.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Browniel Stoker Co., Decatur, Ill.
Brownell Co., Dayton, O.
Bryant Heater Co., Cleveland (Coke).
Burnham Stoker Co., Vancouver, Wash.
Burnwell Corp., Allentown, Pa.
Butler Street Foundry & Iron Co., Chicago.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
Catskill Metal Works, Inc., Catskill, N. Y.
Chicago Automatic Stoker Co., Inc., Chicago.
Coal-O-Matic Stoker Company, Trucksville, Pa. (Anthracite).
Conco Corporation, Mendota, Ill.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).
Conta Transmission Corp., 2340 Eleventh St., Rockford, Ill.
Crane Co., Chicago (Bituminous & Anthracite).
Davy Fuel & Supply Co., Stoker Div., Detroit (Bituminous).
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
(Bituminous).

Delco Appliance Div., General Motors Corp., Rochester, N. Y. (Bituminous).

Dickson Coal Co., New York City.

Dowagiac Steel Furnace Co., Dowagiac, Mich. Eddy Stoker Corp., Chicago.

Electric Furnace-Man, Inc., Emmaus, Pa. Excelsior Stove & Mfg. Co., Quincy, Ill. Fairbanks, Morse & Co., Chicago.

Foy Stoker Mfg. Co., Chicago.

Freed Heater & Stoker Company, Collegeville, Pa. (Anthracite). Frederick Iron & Steel Co., Frederick, Md.

Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis. Fuel Savers, Inc., Harrisburg, Pa. Furnaceslave, Inc., Indianapolis.

Gehl Bros. Mfg. Co., West Bend, Wis. General Machine Co., Inc., Emmaus, Pa.

Advertisement in this issue.

Green Colonial Furnace Co., Des Moines, Ia. Grossenbacher Furnace Co., St. Louis.

Hall-Neal Furnace Co., Indianapolis.

Hamilton Automatic Stoker Corp., Hamilton, O. Heating Assurance, Spokane, Wash.

Hemp Co., Macomb, Ill.

Heritage Coal & Stoker Co., Chicago.

Hess Warming and Ventilating Co., Chicago.

Holcomb & Hoke Mfg. Co., Indianapolis.

Homer Furnace & Foundry Corp., Coldwater, Mich. Ideal Furnace Co., Detroit.

Illinois Iron & Bolt Co., Chicago.

Iron Fireman Mfg. Co., Cleveland.

Jacobson Machine Works, Inc., A. E., Minneapolis.

Keith Furnace Co., Des Moines, Ia.

Kingston Products Corporation, Kokomo, Ind.

Kol-Master Corp., Oregon, Ill.

Link-Belt Co., Chicago. Link-Belt Co., Chicago.

Malco Gear Co., Dolton, Ill.

Meyer Furnace Co., Peoria, Ill.

Motorstoker Div. of Hershey Machine & Foundry Co., Man-

Meyer Furnace Co., Peoria, Ill.
Motorstoker Div. of Hershey Machine & Foundr heim, Pa.
Muncie Gear Works, Inc., Muncie, Ind.
Murray Corporation of America, Detroit.
National Steam Pump Co., Upper Sandusky, O.
Northern Steel & Stoker Corp., Peoria, Ill.
Palmer Mfg. Co., Cleveland.
Peerless Mfg. Co., Louisville, Ky.
Plymouth Industries, Inc., Plymouth, Ind.
Pocahontas Fuel Co., Inc., Stoker Div., Cleveland.
Racine Stoker Mfg. Co., Racine, Wis.
Round Oak Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Schwab Furnace Co., Milwaukee, Wis.
Schwab Safe Co., Lafayette, Ind.
Schwitzer-Cummins Company, Indianapolis.
Scott Engineering Co., Noblesville, Ind.
Scott-Newcomb, Inc., St. Louis.
Sinker-Davis Co., Indianapolis.
Souther Iron Co., E. E., St. Louis.
Steel Products Engineering Co., Springfield, O.
Stowart-Rogers, Inc., Philadelphia (Anthracite).
Stok-A-Fire Co., Inc., University City, Mo.
Stoker-Lad Co., Tacoma, Wash.
Stoker-Lad Co., Tacoma, Wash.
Stokermatic Co., Salt Lake City, Utah.
Stoker Products, Inc., Decatur, Ill.
Susquehanna Engineering Co., Bloomsburg, Pa.
Tropic-Air Stoker Co., Canton, O.
U. S. Machine Corporation, Lebanon, Ind.
Wayne Oil Burner Co., Fort Wayne, Ind.
Will-Burt Co., Orrville, O.
York Corrugating Co., York, Pa.

STOKERS, INDUSTRIAL AND COMMERCIAL

(61 lb. to 300 lb. per hr.)

Advance Appliance Co., Inc., Peoria, Ill.
American Coal Burner Co., Chicago, Ill.
Anchor Stove & Range Co., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Babcock & Wilcox Co., New York City.
Black Servant Stoker Co., St. Louis.
Bluffton Mfg. Co., Findlay, O.
Bros Boller & Mfg. Co., Wm., Minneapolis.
Brownell Co., Dayton, O.
Burke Stoker & Mfg. Co., Chicago.
Burnham Stoker Co., Vancouver, Wash.
Butler Street Foundry & Iron Co., Chicago.
Canton Stoker Corp., Canton, O.
Carpenter Heating & Stoker Company, Cleveland.
Catskill Metal Works, Inc., Catskill, N. Y.
Chicago Automatic Stoker Co., Inc., Chicago.
Coal-O-Matic Stoker Co., Trucksville, Pa. (Anthracite).

Conco Corporation, Mendota, Ill.
Cooper & Cooper, Inc., Pittsfield, Mass. (Anthracite).

Cotta Transmission Corp., 2340 Eleventh St., Rockford, Ill.
Crown Iron Works, Minneapolis.
Detroit Stoker Co., Detroit and Monroe, Mich.
Diamond Castings Co., Johnsonburg, Pa.
Eddy Stoker Corp., Chicago.
Electric Furnace-Man, Inc., Emmaus, Pa.
Fairbanks, Morse & Co., Chicago.
Firemood Machine Wks., Converse, Ind.
Flynn & Emrich Co., Baltimore.
Frederick Iron & Steel Co., Frederick, Md.
Front Rank Furnace Co., Div. Liberty Foundry Co., St. Louis.
Fuel Savers Inc., Harrisburg, Pa.
Gehl Bros. Mfg. Co., West Bend, Wis.
General Machinery Co., Spokane, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids,
Mich.

Hall-Neal Furnace Co., Indianapolis.
Hamilton Automatic Stoker Corp., Hamilton, O.

 Hall-Neal Furnace Co., Indianapolis.
 Hamilton Automatic Stoker Corp., Hamilton, O.
 Hare Stoker Corp., Detroit.
 Heating Assurance, Spokane, Wash. Hemp Co., Macomb, Ill.

Heritage Coal & Stoker Co., Chicago.
Holcomb & Hoke Mfg. Co., Indianapolis.
Illinois Iron & Bolt Co., Chicago.
International Engineering Wiss., Inc., Framingham, Mass.
Iron Fireman Mfg. Co., Cleveland.
Jacobson Machine Works, Inc., A. E., Minneapolis.
Kingston Products Corporation, Kokomo, Ind.
Kol-Master Corp., Oregon, Ill.
Leffel & Co., James, Springfield, O.
Link-Belt Co., Chicago.
Mallory Sales Co., Dolton, Ill.
Mesker & Co., Geo. L., Evansville, Ind.

Meyer Furnace Co., Peorla, Ill.
Motorstoker Div. of Hershey Machine & Foundry Co., Manheim, Pa.

Motorstoker Div. of Hershey Machine & Foundry Co., helm, Pa.

Muncie Gear Works, Inc., Muncie, Ind.

National Steam Pump Co., Upper Sandusky, O. Neemes Foundry Inc., Troy, N. Y.

Northern Steel & Stoker Corp., Peoria, Ill.

Ormsby-Osterman Co., St. Louis.

Over-Spred Stoker Co., Chicago.

Patterson Foundry & Machine Co., East Liverpool, O. Perfection Grate & Stoker Co., Springfield, Mass.

Plymouth Industries, Inc., Plymouth, Ind.

Pocahontas Fuel Co., Inc., Cleveland.

Racine Stoker Mfg. Co., Racine, Wis.

Riley Stoker Corp., Worcester, Mass.

Rosedale Fdry. & Mach. Co., N. S., Pittsburgh.

Rudy Furnace Co., Lafayette, Ind.

Schwitzer-Cummins Company, Indianapolis.

Schwitzer-Cummins Company, Indianapolis.

Schwitzer-Cummins Company, Indianapolis.

Steel Products Engineering Co., Springfield, O.

Stok-A-Fire Co., Inc., University City, Mo.

Stokermatic Co., Salt Lake City, Utah.

Stoker Products. Inc., Decatur, Ill.

Sun-Fire Stoker Corporation, New Albany, Ind.

Susquehanna Engineering Co., Bloomsburg, Pa.

Taylor Engineering Co., Cincinnati.

Tropic-Air Stoker Co., Canton, O.

U. S. Machine Corporation, Lebanon, Ind.

Wayne Oil Burner Co., Fort Wayne, Ind.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Whitty Company, Inc., Boston (Allston), (Bituminous).

Will-Burt Co., Orrville, O.

Will-Burt Co., Orrville, O.

STOVES See Heaters

STRAINERS, CONDUCTOR

See Fittings and Accessories, Conductor

STRAPS, LEADER

See Fittings and Accessories, Conductor

SWITCHES, MAGNETIC

SWITCHES, MAGNETIC

Allis-Chalmers Mfg. Co., Milwaukee.
Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
Automatic Switch Co., New York City.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Company, Rockford, Ill.
Clark Controller Co., Cleveland.
Cook Electric Co., Chleago.
Cutler-Hammer, Inc., Milwaukee.

Detroit Lubricator Co., Detroit.
Dunn Inc., Struthers, Philadelphia.
Electric Controller & Mfg. Co., Cleveland.

General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago.
H-B Instrument Co., Inc., Philadelphia.
Hart Mfg. Co., Hartford, Conn. (Mercury Tube).
Industrial Engineering Corp., Terre Haute., Ind.

McDonnell & Miller, Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Monitor Controller Co., Baltimore.
Palmer Electric Co., Chicago.

Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Square D Co., Detroit.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

White-Rodgers Electric & Mfg. Co., East Pittsburgh, Pa.

SWITCHES, MANUAL

Allen-Bradley Co., Milwaukee.
Arrow-Hart & Hegeman Electric Co., Hartford, Conn.
B/W Controller Corp., Birmingham, Mich.
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.

Cutler-Hammer, Inc., Milwaukee.
Dual Remote Control Co., Wayne, Mich.
Durakool, Inc., Elkhart, Ind. (Mercury).
Electric Controller & Mfg. Co., Cleveland, O.
General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.

Industrial Engineering Corp., Terre Haute, Ind.
Square D Co., Detroit.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mount Vernon, N. Y. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa

SWITCHES, TIME

Allen-Bradley Company, Milwaukee.
Au-Temp-Co. Corp., New York City.
Automatic Temperature, Control Co., Inc., Philadelphia
Barber-Colman Co., Rockford, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cramer Company, Inc., R. W., Centerbrook, Conn.
Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Gleason-Avery, Inc., Auburn, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
International Register Co., Chicago.
Mercoid Corp., Chicago.

 Mercoid Corp., Chicago.

 Minneapolis-Honeywell Regular Co., Minneapolis.
 National Time & Signal Corp., Detroit.
 Paragon Electric Co., Chicago.

 Penn Electric Switch Co., Goshen, Ind.
 Perfex Corp., Milwaukee. Perfex Corp., Milwaukee.
Reliance Automatic Lighting Co., Racine, Wis.
Rhodes, Inc., M. H., Hartford. Conn.
Sampsel Time Control, Inc., Spring Valley, Ill.
Sangamo Electric Co., Springfield, Ill.
Spencer Thermostat Co., Attleboro, Mass.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
White-Rodgers Electric Co., St. Louis.
Zenith Electric Company, Chicago.

TEES, FURNACE PIPE See Fittings and Accessories, Furnace Pipe

TEMPERATURE CONTROLS

See Thermostats

TEMPERATURE RECORDERS See Recorders, Temperature

TIMING MACHINES See Motors, Timing

TINNING See Baths, Tinning

> TINPLATE See Sheets, Tin

TIPS, DAMPER See Clips and Tips, Damper

THERMOMETERS, INDICATING

American Schaeffer & Budenberg Instrument Div., Manning.
Maxwell & Moore, Inc., Bridgeport, Conn.
Bacharach Industrial Instrument Co., Pittsburgh.
Barclay, Inc., Robert, Chicago (Flue Gas).
Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co.,
Philadelphia.

Brown Instrument Co., Div. of Minneapolis-Honeywell Re Philadelphia,
Cooper Oven Thermometer Co., Pequabuck, Conn. Defender Automatic Regulator Co., St. Louis.
Dickson Co., Chicago.
Fee & Stemwedel, Inc., Chicago.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York City.
H-B Instrument Co., Inc., Philadelphia.
Hill, E. Vernon, Chicago.
Illinois Testing Laboratories, Inc., Chicago.
Leeds & Northrup Co., Philadelphia.
Marsh Corporation, Jas. P., Chicago.
Mason-Neilan Regulator Co., Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Co., Cincinnati.
Powers Regulator Company, Chicago (Dial).
Precision Thermometer & Instrument Co., Philadelphia.
Preferred Utilities Mfg. Corp., New York City.
Rochester Mfg. Co., Rochester, N. Y. (Dial).
Sarco Company, Inc., New York City.
Scientific Instrument Co., Detroit.
Standard Thermometer, Inc., Boston.
Tagliabue Mfg. Co., C. J., Brooklyn.
Taylor Instrument Companies, Rochester, N. Y.

Trerice Co., H. O., Detroit. United States Gauge Co., New York City.
Weksler Thermometer Corp., New York City.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Co., Chicago.

THERMOSTATS, DAY AND NIGHT, CLOCK

Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.

Detroit Lubricator Co., Detroit.
General Controls Co., Glendale, Calif.
General Electric Co., Bloomfield, N. J.
Gleason-Avery, Inc., Auburn, N. Y.
Mercoid Corporation, Chicago.
Minneapolis-Honeywell Regular Co., Minneapolis, Minn.
Penn Electric Switch Co., Goshen, Ind.

Minneapolis-Honeywell Regular Co., Minneapolis, Minn.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O. Sampsel Time Control, Inc., Spring Valley, Ill.
Schwab Safe Co., Lafayette, Ind.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
White Manufacturing Co., St. Paul, Minn.
White-Rodgers Electric Co., St. Louis.

THERMOSTATS, HEAT ACCELERATED OR ANTICIPATING

 Au-Temp-Co Corp., New York City
 Automatic Products Co., Milwaukee Barber-Colman Company, Rockford, Ill.

Barber-Colman Company, Rockford, Ill.
Cook Electric Co., Chicago.
Detroit Lubricator Co., Detroit.
Friez Instrument Division, Towson, Md.
Fulton Sylphon Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
General Electric Co., Bloomfield, N. J.
H-B Instrument Co., Inc., Philadelphia, Pa.
Mercold Corporation, Chicago.
Minneapolis-Honeywell Regular Co., Minneapolis.
Penn Electric Switch Co., Gosben, Ind.

Minneapolis-Honeywell Regular Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
Precision Thermometer and Instrument Co., Philadelphia.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
Tagliabue Mfg. Co., C. J., Brooklyn.
White-Rodgers Electric Co., St. Louis.

THERMOSTATS, LINE VOLTAGE

THERMOSTATS, LINE VOLTAGE

American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.

Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.

Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Friez Instrument Division, Towson, Md.

General Controls Co., Glendale, Calif.
General Electric Co., Bloomfield, N. J.
H-B Instrument Co., Inc., Philadelphia.

Mercoid Corporation, Chicago.

Minneapolis-Honeywell Regulator Co., Minneapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Ranco Inc., Columbus, O.
Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.

THERMOSTATS, LOW VOLTAGE

American Instrument Co., Silver Spring, Md.
Au-Temp-Co Corp., New York City.

• Automatic Products Co., Milwaukee.
Barber-Colman Company, Rockford, Ill.
Cook Electric Co., Chicago, Ill.
Crise Electric Mfg. Co., Columbus, O.
• Detroit Lubricator Co., Detroit.
Edison, Inc., Thomas A., Intrument Div., West Orange, N. J.
Friez Instrument Division, Towson, Md.
• General Controls Co., Glendale, Calif.
• General Electric Co., Bloomfield, N. J.
• Gleason-Avery, Inc., Auburn, N. Y.
H-B Instrument Co., Inc., Philadelphia.
McCorkle Co., D. H., Berkeley, Calif.
Magnet Switch Co., Chicago.
• Mercoid Corporation, Chicago.
• Minneapolis-Honeywell Regulator Co., Minneapolis.
• Penn Electric Switch Co., Goshen, Ind.

Minneapolis-Honeyweii Regulator Co., Annieapolis.
Penn Electric Switch Co., Goshen, Ind.
Perfex Corp., Milwaukee.
Pioneer Heat Regulator Div., Master Electric Co., Dayton, O.
Sampsel Time Control, Inc., Spring Valley, Ill.
Sarco Company, Inc., New York City.
Schwab Safe Co., Lafayette, Ind.
Spencer Thermostat Co., Attleboro, Mass.
United Electric Controls Co., South Boston, Mass.

White Manufacturing Co., St. Paul, Minn.
White-Rodgers Electric Co., St. Louis.

THERMOSTATS, MODULATING OR PROPORTIONING

Atlas Valve Company, Newark, N. J. (Air Operated).
Au-Temp-Co Corp., New York City.
Barber-Colman Company, Rockford, Ill.
Defender Automatic Regulator Co., St. Louis.
H-B Instrument Co., Inc., Philadelphia.
Johnson Service Company, Milwaukee.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Schwab Safe Co. Lefavette Ind.

Schwab Safe Co., Lafayette, Ind. Tagliabue Mfg. Co., C. J., Brooklyn. White Manufacturing Co., St. Paul, Minn.

THROUGH WALL FLASHINGS

See Flashings, Through Wall

TIME SWITCHES

See Switches, Time

TIMING MACHINES

See Machines, Timing, for Stoker Controls

TIMING MOTORS

See Motors. Timing

TINNING FLUXES

See Compounds, Tinning

TOGGLE BOLTS

See Bolts, Toggle

TOOLS, FIRING

Adams Company, The. Dubuque, Ia. (Clinker Tongs, Rakes, Hoes, Pokers, Ash Removers for Stokers).
 Apfel & Company, Hamilton, O. (Pokers, Rakes, Lighters, Clinker Tongs).

Farrell-Cheek Steel Company, Stoker Parts Div., Sandusky, O. (Clinker Tongs, Rakes, Hooks, Slice Bars, Pokers, Back-up

Wrenches). Northwestern Stove Repair Co., Chicago.
Roesch & Associates, Inc., Syracuse, N. Y.
Stratton & Terstegge Co., Louisville, Ky. (Clinker Tongs).

TOOLS, METAL WORKERS'

Allegheny-Ludlum Steel Corporation, Brackenridge, Pa.

Barth Mfg. Co., Plantsville, Conn.
Brown-Appton Company, New York City (Pneumatic Hammer).
C-B Tool Co., Lancaster, Pa. (Rivet Cutter).
Champion Tool Co., Los Angeles (Pipe Crimper).
Cherry Rivet Co., Los Angeles (Rivet Gun).
Chicago Pneumatic Tool Co., New York City (Pneumatic Hammer).

mer).

Crescent Tool Co., Jamestown, N. Y. (Scratch Awls, Pliers, Screw-drivers).

Damascus Steel Products Corporation, Rockford, Ill. (Punches, Chisels, Star Drills, Nippers).

Greenlee Tool Co., Rockford, Ill. (Pipe Benders, Chisels, Screw

Drivers)

Grobet File Corp. of America, New York City (Files). Haines Gauge Company, Inc., Philadelphia (Thickness Gauges). Hauck Manufacturing Co., Brooklyn (Asphalt and Pitch Kettles)

Kettles).

Hub Specialty Co., Somerville, Mass. (Awl).

Interstate Sales Co., New York City (Angle Meters, Circle Meters, Divizor, Mechanic's Protractor).

Johnson Ladder & Shoe Co., Eau Claire, Wis. (Ladder Shoes).

Millers Falls Co., Greenfield, Mass. (Hack Saws).

Misener Mfg. Co., Inc., Syracuse, N. Y. (Rotary Hack Saw and Blades, and Hole Saw for Metal and Wood).

Myers Ladder Equipment Company, Madison, Wis. (Ladder Brockets)

Brackets).

Brackets).

Niagara Machine & Tool Works, Buffalo.
Packham Crimper Co., Mechanicsburg, O. (Crimping Tongs).

Peck, Stow & Wilcox Co., Southington, Conn.
Penn Tool Co., Philadelphia (Punches, Chisels and Edge Tools).
Phillips Drill Co., Chicago (Anchor Bolt Drill).
Poe, Ralph W., Canton, Ill. (Sheet Metal Cutters).
Reiner & Campbell Co., Inc., Elizabeth, N. J. (Dividers).
Skilsaw, Inc., Chicago (Blowers and Suction Cleaners).
Snap-On Tools Corp., Kenosha, Wis. (Hammers, Screw Drivers, Chisels, Punches, Soldering Irons and Pilers, Hack Saws, Drills, Files, Bolt Cutters, Metal Shears, Tin Snips).
Stanley Tools, New Britain, Conn. (Punches, Hammers, Rules, Cold Chisels, Levels, Bit Braces, Squares).
Star Electric Motor Co., Bloomfield, N. J. (Drill Sharpener).
Vulcan Electric Co., Danvers, Mass. (Electric Soldering Irons, Solder Pots, Glue Pots).

Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill. (Aircraft Rivet Squeezer).

Squeezer). Wodack Electric Tool Corp., Chicago (Electric Hammer and

Groover).

TOOLS, ROOFERS'

Adams Company, Dubuque, Ia. (Scaffold Brackets).
 Aeroll Burner Co., Inc., West New York, N. J. (Melting Kettles, Holsts, Buckets, Tools and Accessories).
 Alax Building Bracket Co., Cleveland Heights, O. (Brackets).
 All States Roofers Equip. & Mat'l Co., Chicago (Complete Line).
 Belden Machine Company, New Haven, Conn. (Hammer, Ripper, Stake & Punch).

Belden Machine Company, New Haven, Conn. (Hammer, Ripper, Stake & Punch).

Eastern States Supply Co., Brooklyn (Mops, Hoist Wheel, Buckets, Dippers, Slaters' Tools, Tin Discs).

Elermann Floor Scraper Co., Port Chester, N. Y. (Tar).

Frey & Co., Frank P., Chicago.

Littleford Bros., Inc., Cincinnati.

Milcor Steel Co., Milwaukee.

Nlagara Machine & Tool Works, Buffalo.

Peck, Stow & Wilcox Co., Southington, Conn.

Southbridge Roofing Company, Inc., Southbridge, Mass. (Scrapers, gravel spreaders, tinners' firepots, buckets, kettles).

Structural Slate Co., Pen Argyl, Pa. (Hammer, Ripper and Stake, also Portable Machine Cutter and Punch).

TOPS, CHIMNEY

See Caps and Tops, Chimney

TORCHES, BRAZING, CUTTING, WELDING, ELECTRIC

Borm Manufacturing Company, Elgin, Ill. Marquette Mfg. Co., Inc., Minneapolis. National Cylinder Gas Co., Chicago. Will-Weld Manufacturing Co., Omaha, Nebr.

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TORCHES, BRAZING, CUTTING, WELDING, **OXY-ACETYLENE**

OXY-ACETYLENE

Aeroil Burner Co., Inc., West New York, N. J.
Air Reduction Sales Co., New York City.
Atkins and Company, Inc., E. C., Indianapolis.
Bastian-Blessing Co., Chicago.
Bernz Co., Otto, Rochester, N. Y. (Brazing).
Burdett Mfg. Co., Chicago.
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Dockson Corporation, Detroit.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Manufacturing Co., Philadelphia.
Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Linde Air Products Co., The, New York City.
Lonn Mfg. Co., Inc., Chicago.
Marquette Manufacturing Co., Inc., Minneapolis.
Milburn Co., Alexander, Baltimore.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Victor Equipment Company, San Francisco. Trindl Products, Ltd., Chicago.
Victor Equipment Company, San Francisco.
Wall Chemical Div., Liquid Carbonic Corp., Chicago.
Welding Apparatus Co., Chicago.

TORCHES, SOLDERING

TORCHES, SOLDERING

Air Filter Engineering Co., Chicago.
Bastian-Blessing Co., Chicago.
Berns Co., Otto, Rochester, N. Y.
Choate Mfg. Co., Cincinnati.
Clayton & Lambert Mfg. Co., Dearborn, Mich.
Detroit Torch & Mfg. Co., Detroit,
Diener Mfg. Co., Geo. W., Chicago.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Manufacturing Co., Philadelphia.
Everhot Mfg. Co., Maywood, Ill.
Harris Calorific Co., Cleveland.
Ideal Commutator Dresser Co., Sycamore, Ill.
Imperial Brass Mfg. Co., Chicago.
Insto-Gas Corporation, Detroit.

Johnson Gas Appliance Co., Cedar Rapids, Ia.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Linde Air Products Co., The, New York City.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
National Safety Device Co., Chicago.
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Reliable Gas Products Co., Tedar Rapids, Ia.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Torit Manufacturing Co., St. Paul, Minn.
Turner Brass Works, Sycamore, Ill.
Unique Manufacturing Co., Inc., Chicago (Gasoline).
Van Praag Sales, New York City.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
Wall Mfg. Supply Co., P., N. S. Pittsburgh.
Welding Apparatus Co., Chicago.

TRANSFORMERS, IGNITION

Davis & Co., Inc., Dean W., Chicago. General Electric Co., Schenectady, N. Y. Harvey, Inc., Sid, Valley Stream, N. Y. Jefferson Electric Company, Beliwood, Ill. Webster Electric Co., Racine, Wis.

TRANSFORMERS, LOW VOLTAGE

Barber-Colman Co., Rockford, Ill.
Canatsey Electric Manufacturing Co., Kansas City, Mo.
Cook Electric Co., Chicago.
Davis & Co., Inc., Dean W., Chicago.

Detroit Lubricator Co., Detroit.
Friez Instrument Division, Towson, Md.
General Controls Co., Glendale, Calif.
General Electric Co., Schenectady, N. Y.
Ideal Commutator Dresser Co., Sveamore, Ill.

General Electric Co., Schenectady, N. Y.
Ideal Commutator Dresser Co., Sycamore, Ill.
Jefferson Electric Co., Bellwood, Ill.

Mercoid Corporation, Chicago.
Minneapolis-Honeyweil Regulator Co., Minneapolis.
Ploneer Heat Regulator Div., Master Electric Co., Dayton, O.
Taylor-Winfield Corp., Warren, O.

Wagner Electric Corp., St. Louis.
Webster Electric Co., Racine, Wis.
Westinghouse Electric Co., Racine, Wis.

Westinghouse Electric & Manufacturing Co., East Pittsburgh,

TRANSMISSIONS, VARIABLE SPEED

Lewellen Mfg. Co., Columbus, Ind.

TRIM, ORNAMENTAL

See Moulding and Trim, Ornamental

TUBING, COPPER

Allegheny-Ludlum Steel Corporation, Brackenridge, Pa. (Stain-

Alegneny-Ludium Steel Corporation, Brackenridge, Fa. (Stainless)

American Brass Co., Waterbury, Conn.

Bridgeport Brass Co., Bridgeport, Conn.

Chase Brass & Copper Co., Inc., T. E., New York City.

Downs-Smith Brass & Copper Co., Inc., New York City.

Hussey & Co., C. G., Pittsburgh.

Imperial Brass Mfg. Co., Chicago.

Lewin-Mathes Company, Lewin Metals Div., St. Louis.

McDonnell & Miller, Chicago.

Mueller Brass Co., Port Huron, Mich.

Parker Appliance Co., Cleveland.

Phelps Dodge Copper Products Corp., British American Tube

Div., New York City.

Revere Copper & Brass Incorporated, New York City.

Roberts Tube Works, Detroit.

Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.

United States Brass & Copper Co., Hyde Park, Mass.

Wolverine Tube Div., Calumet and Hecla Consolidated Copper Company, Detroit.

TUBING AND FITTINGS, PLASTIC

Acadia Synthetic Products Division, Chicago. Dow Chemical Co., Midland, Mich.
Extruded Plastics, Inc., Norwalk, Conn.
Firestone Tire & Rubber Co., Akron, O.
General Electric Co., Plastics Div., 1 Plastics Ave., Pittsfield, Mass. Mass.
Hodgman Rubber Co., Framingham, Mass.
Irvington Varnish and Insulator Co., Irvington, N. J.
Mills Corp., Elmer E., Chicago.
North Penn Co., New York City.
Parker Appliance Co., Cleveland.
Skuttle Manufacturing Co., Detroit.
United States Stoneware Co., Akron, O., and New York City.
Werner Co., Inc., R. D., New York City.

UNITS, AIR CONDITIONING See Air Conditioning Units

UNITS, FUEL FOR OIL BURNERS

Kraissl Company, Inc., Hackensack, N. J. Monarch Manufacturing Works, Inc., Philadelphia. Sundstrand Pump Division, Rockford, Ill. Webster Electric Co., Racine, Wis.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Manufacturing Co., Chicago.
American Air Conditioning Co., Detroit.
Automatic Ventilator Company, Corunna, Mich.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Davies Air Filter Corp., New York.
Gale Products, Galesburg, Ill.

Ilg Electric Ventilating Co., Chicago.
Kaiser Co., H. S., Chicago.

Kauffman Air Conditioning Corp., St. Louis.
Meilish & Murray Co., Chicago.
Reed Unit-Fans, Inc., New Orleans.
Reliable Sheet Metal Engineering Co., Chicago.
Somers, Inc., H. J., Detroit.
Trade-Wind Motor Fans, Inc., Los Angeles.
Unified Air Conditioner Co., Duluth, Minn.
Utility Fan Corporation, Los Angeles.
Vita-Screen Ventilator Co., New York City.

VACUUM CLEANERS FOR FURNACES

See Cleaners, Vacuum, Furnace

VALVES, GAS PRESSURE REGULATING
Atlas Valve Co., Newark.

Barber Gas Burner Co., Cleveland.
Belfield Co., H., Philadelphia.
Bryant Corp., C. L., Cleveland.
Cooper Co., Clark, Palmyra, N. J.
Davis Regulator Co., Chicago.
Defender Automatic Regulator Co., St. Louis. (Chronometer)
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Fox Control & Mfg. Co., Cleveland.
Friez Instrument Division, Towson, Md.
Fulton Sylphon Co., Knoxville, Tenn.

General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.

Hotstream Heater Co., Cleveland.
Kieley & Mueller, Inc., North Bergen, N. J.
Mason-Neilan Regulator Co., Dorchester, Mass.

Mercoid Corp., Chicago.
 Milwaukee Gas Specialty Company, Milwaukee

Minneapolis-Honeywell Regulator Co., Minneapolis.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Denver, Colo.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Reading-Pratt & Cady Div., American Chain & Cable Co., Inc., Reading, Pa.

Roberts-Gordon Appliance Corp., Buffalo. Tagliabue Mfg. Co., C. J., Brooklyn. Trerice Co., H. O., Detroit.

VALVES, HUMIDIFIER, WATER LEVEL

VALVES, HUMIDIFIER, WATER LEVEL
Badger Mfg. & Sales Co., Milwaukee.
Barclay, Inc., Robert, Chicago.
Belifield Co., H., Philadelphia.
Fisher Governor Co., Marshalltown, Ia.
G. & S. Tool Co., Detrolt.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh.
Klipfel Mfg. Co., Chicago.
Madi-O'-Mist, Inc., Chicago.
McAlear Mfg. Co., Chicago.
McDonnell & Miller, Chicago.
Minneapolis-Honeywell Regulator Co., Minneapolis.
Monmouth Products Co., Cleveland.
Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
Skuttle Manufacturing Co., Detroit.
Viking Air Conditioning Corp., Cleveland.

Viking Air Conditioning Corp., Cleveland.

VALVES, SOLENOID

VALVES, SOLENOID

Albright Equipment Co., Johnstown, Pa.
Alco Valve Co., St. Louis.
Au-Temp-Co Corp., New York City.

• Automatic Products Co., Milwaukee.
Automatic Switch Co., New York City.
Barber-Colman Co., Rockford, Ill.
Belfield Co., H., Philadelphia.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee.
Davis Regulator Co., Chicago.
• Detroit Lubricator Co., Detroit.
Electric Valve Mfg. Co., Inc., New York City.
Electrimatic Division, The Simoniz Co., Chicago.
Frick Company, Waynesboro, Pa.
General Controls Co., Glendale, Calif. (Magnetic)
General Electric Cc., Schenectady, N. Y.
General Sales & Products Co., Cohoes, N. Y.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hubbell Corp., Chicago. Hubbell Corp., Chicago.
Hunt & Son, C. B., Salem, O.

McDonnell & Miller, Chicago.

Mercoid Corp., Chicago.

Mercoid Corp., Chicago.
Milwaukee Gas Specialty Company, Milwaukee.

Minneapolis-Honeywell Regulator Co., Minneapolis.

Payne Furnace & Supply Co., Inc., Beverly Hills, Calif.

Penn Electric Switch Co., Goshen, Ind.
Pfening Co., Fred D., Columbus, O.
R-S Products Corporation, Philadelphia.
Ruggles-Klingemann Mfg. Co., Salem, Mass.
Sarco Co., Inc., New York City.
Spochrer-Lange Co., St. Louis.
Square D Company, Detroit.
Supreme Electric Products Corp., Rochester, N. Y.
Wheelco Instruments Co., Chicago.

White-Rodgers Electric Co., St. Louis.

Advertisement in this issue. See Index to Advertisers, page 314.

VANES, DUCT TURNING, PREFABRICATED

Air Devices, Inc., New York City.
Barber-Colman Company, Rockford, Ill.
Stewart Manufacturing Co., Orange, N. J. (Outlet Scoops)
Tuttle & Bailey, Inc., New Britain, Conn.
Waterloo Register Company, Waterloo, Ia.

VENETIAN BLINDS See Blinds, Venetian

VENTILATORS, BLACKOUT

Air Conditioning Products Co., Detroit.
Carrier Corporation, Syracuse, N. Y.
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
De Bothezat Ventilating Equipment Div., American Machine & Metals, Inc., East Moline, Ill.
Trane Company, LaCrosse, Wis.
Young Radiator Co., Racine, Wis.

VENTILATORS, CEILING

VENTILATORS, CEILING
Airmaster Corp., Chicago.

• Auer Register Co., Cleveland.
Barber-Colman Company, Rockford, Ill.
Best Register Co., Milwaukee.
• Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Decatur Iron & Steel Co., Decatur, Ala.
• Elgo Shutter & Manufacturing Co., Detroit.
Falstrom Co., Passaic, N. J.
Gillian Mfg. Co., Detroit.
• Hart & Cooley Mfg. Co., Holland, Mich.
Klauer Manufacturing Co., Dubuque, Ia.
Lamneck Products Co., Middletown, O.
Milcor Steel Co., Milwaukee.
Miller & Doing, Brooklyn.
• Tuttle & Balley, Inc., New Britain, Conn.
• United States Register Co., Battle Creek, Mich.
Universal Blower Co., Birmingham, Mich.

VENTILATORS, MUSHROOM

 Aeolus Dickinson, Chicago.
 Best Register Co., Milwaukee.
 DeBothezat Ventilating Equip. Div., American Machine & Metals DeBothezat Ventilating Equip. Div., American Mach Inc., East Moline, Ill. Knowles Mushroom Ventilator Co., Montclair, N. J. Martin Fan & Blower Co., Chicago. • Mueller Furnace Co., L. J., Milwaukee. Penn Ventilating Co., Philadelphia. Peters-Dalton, Inc., Detroit. • Tuttle & Bailey, Inc., New Britain, Conn. Ventilating Products Co., Chicago.

VENTILATORS, ROOF, FAN

VENTILATORS, ROOF, FAN

Acolus Dickinson, Chicago.
Air Controls, Inc., Cleveland.
Airmaster Corp., Chicago.
Allen Corp., Detroit. (Turbine)
American Blower Corporation, Detroit.
American Coolair Corp., Jacksonville, Fia.
American Steel Band Co., Pittsburgh.
American Steel Band Co., Pittsburgh.
Arex Co., Chicago.
Belanger Fan & Blower Co., Detroit.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilating Co., New York City. (Turbine)
Chelsea Fan & Blower Co., Inc., Irvington, N. J.
Clay Equipment Corp., Cedar Falls, Ia.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
DeBothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.
Diehl Mfg. Company, Somerville, N. J.
Dual-Air Fan Corporation, Chicago.
Economy Electric Mfg. Co., Cicero, Ill.
Electrovent Fan & Mfg. Co., Chicago.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
Gallaher Company, Owatonna, Minn. (Centrifugal)
Gehri Company, Tacoma, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids.
Mich.
Hirschman Co., Inc., W. F., Buffalo.

Mich.

Mich.

Hirschman Co., Inc., W. F., Buffalo.

Howes-Woods Company, Cambridge, Mass.

Ilg Electric Ventilating Co., Chicago.

International Engineering, Inc., Dayton, O.

Iona Ventilator Co., Inc., Philadelphia.

Johnson Fan & Blower Corp., Chicago.

Jordan & Co., Paul R., Indianapolis. (Turbine)

Kernchen Co., Chicago.

King Ventilating Co., Owatonna, Minn.

Klauer Manufacturing Co., Dubuque, Ia.

Klee Co., George B., Cincinnati.

Lohman Inc., William J., Irvington, N. J.

Martin Fan & Blower Co., Chicago.

Mellish & Murray Co., Chicago.

Myers Electric Co., Pittsburgh.

Nelson Corporation, Herman, Moline, Ill.

New York Blower Co., Chicago.

Index to Advertisers, page 314.

Penn Ventilating Co., Philadelphia.
Peters-Dalton, Inc., Detroit.
Propellair, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans.
Robertson Co., H. H., Pittsburgh. (Round-Rectangular)
Royal Ventilator Co., Philadelphia.
Schwitzer-Cummins Company, Indianapolis.
Sturtevant Co., B. F., Hyde Park, Boston.
Swartwout Co., Cleveland.
Trade-Wind Motor Fans, Inc., Los Angeles.
Trane Company, LaCrosse, Wis.
Truflo Fan Co., Harmony, Pa.
Uno Ventilator Co., Cliftondale, Mass. (Turbine)
Utility Fan Corporation, Los Angeles.
Van Noorden Company, E., Boston.
Viking Air Conditioning Corp., Cleveland.
Washburne & Co., E. G., New York City.
Waverly Heating Supply Co., Boston.
Western Engineering & Mfg. Co., Los Angeles.
Wind-Way Fan & Ventilator Co., Inc., New Orleans.
Wing Mfg. Co., L. J., New York City.
Winkler & Sons, Inc., A. E., Milwaukee.
Young Radiator Company, Racine, Wis.

VENTILATORS, ROOF, GRAVITY

Accurate Mfg. Works, Chicago.
Air Devices, Inc., New York City.
A-J Manufacturing Co., Kansas City.
Acolus Dickinson, Chicago.
Air Control Products, Inc., Coopersville, Mich.
Allen Corp., Detroit. (Turbine)
American-Larson Ventilating Co., Pittsburgh.
American Metal Products, Fort Worth, Tex.
American Steel Band Co., Pittsburgh.
Ames Co., W. R., San Francisco.
Anderson Mfg. Co., Des Moines, Ia.
Arex Co., Chicago. Arex Co., Chicago. Autoforce Ventilating System, Boston.

Autoforce Ventilating System, Boston.

Berger Bros. Co., Philadelphia.
Breidert Co., G. C., Los Angeles.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Chicago Metal Mfg. Co., Chicago.
Cincinnati Sheet Metal & Roofing Co., Cincinnati.
Clay Equipment Corp., Cedar Falls, Ia.
Danzer Metal Works Co., Hagerstown, Md.
Day Co., The, Minneapolis.
Edwards Mfg. Co., Inc., Cincinnati.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Fingles Co., The, Baltimore, Md.
Gehri Company, Tacoma, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids,
Mich.

Gehrl Company, Tacoma, Wash.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rap Mich.
Hirschman Co., Inc., W. F., Buffalo.
Howes-Woods Company, Cambridge, Mass.
International Steel Co., Evansville, Ind.
Iona Ventilator Co., Inc., Philadelphia.
Iwan Brothers, South Bend, Ind.
Jamar Co., Walker, Duluth, Minn.
Jordan & Co., Paul R., Indianapolis. (Turbine)
Kernchen Co., Chicago.
King Ventilating Co., Owatonna, Minn.
Klauer Manufacturing Co., Dubuque, Ia.
Kleenaire Corp., Stevens Point, Wis.
LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
Lamneck Products, Inc., Middletown, O.
Lee & Son Co., Thomas, Cincinnati.
Leslie Welding Co., Chicago. (Slant Roof Louver)
Levow, David, New York City.
Lyon, Conklin & Co., Inc., Baltimore, Md.
Mellish & Murray Co., Chicago.
Merchant & Evans Co., Philadelphia.
Milcor Steel Co., Milwaukee.
Moeschl-Edwards Corrugating Co., Inc., Cincinnati.
Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
Osborn Co., J. W. & L. A., Cleveland.
Patten Co., J. V., Sycamore, Ill.
Penn Ventilating Co., Philadelphia.
Peters-Dalton, Inc., Detroit.
Pioneer Roofing & Sheet Metal Co., Muskogee, Okla.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H., Pittsburgh. (Monitor)
Royal Ventilator Co., Philadelphia.
Ryniker Steel Products Company, Billings, Mont.
St. Paul Corrugating Co., St. Paul, Minn.
Schoedinger, F. O., Columbus, O.
Sheet Metal Mfg. Co., Inc., Brooklyn.
Southbridge Roofing Co., Inc., Brooklyn.
Southeriace & Supply Company, Omaha, Nebr.
Standard Furnace &

Van Noorden Company, E., Boston.
Western Engineering & Mfg. Co., Los Angeles.
Willis Steel Corporation, Galesburg, Ill.
Winkler & Sons, Inc., A. E., Milwaukee.
York Corrugating Co., York, Pa.

VENTILATORS, ROOF, RIDGE

Accurate Mfg. Works, Chicago.
Aeolus Dickinson, Chicago.
Arex Co., Chicago.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., New York City.
Gehri Company, Tacoma, Wash.
Klauer Manufacturing Co., Dubuque, Ia.
Penn Ventilating Co., Philadelphia.
Robertson Company, H. H., Pittsburgh.
Royal Ventilator Co., Philadelphia.
Souther Iron Co., E. E., St. Louis.
Swartwout Co., Cleveland.
Van Noorden Company, E., Boston.

VIBRATION ISOLATERS

See Bases and Pads

WARM AIR REGISTER SHIELDS See Shields, Warm Air Register

WASHERS, AIR, HEATING AND VENTILATING (Capacity 4,000 c.f.m. and up)

(Capacity 4,000 c.f.m. and up)

Air & Refrigeration Corp., New York City.
Airwasher Corporation, Lansing, Mich.
American Blower Corp., Detroit.
American-Larson Ventilating Co., Pittsburgh.
Ames Co., W. R., San Francisco.
Atlas Heating & Ventilating Co., Ltd., San Francisco.
Ballantyne Co., Omaha, Nebr.

Bayley Blower Co., Milwaukee.
Betz Engineering Co., Kansas City, Mo.
Bishop & Babcock Mfg. Co., Cleveland.
Blower Application Co., Milwaukee.
Buffalo Forge Co., Buffalo.

Clarage Fan Co., Kalamazoo, Mich.
Columbus Heating & Ventilating Co., Columbus, O.
Electrovent Fan & Mfg. Co., Chicago.
Mulray Manufacturing Co., D. J., Wausau, Wis.
New York Blower Co., Chicago.
Niagara Blower Co., Chicago.
Niagara Blower Co., New York City.
Northern Blower Co., Cleveland.
Parks-Cramer Co., Fitchburg, Mass.
Peters-Dalton, Inc., Detroit.
Phillips Cooling Tower Co., Inc., New York City.
Ross Sprinkler Co., Pasadena, Calif.
Schmieg Industries, Detroit.
Spray Engineering Co., Somerville, Mass.
Spray Wheel Air Conditioners, Inc., Denver, Colo.
Strandwitz & Co., Inc., W. J., Camden, N. J.
Sturtevant Co., B. F., Hyde Park, Boston.
Supreme Heater & Ventilating Corp., St. Louis.
Trane Co., La Crosse, Wis.

U. S. Air Conditioning Corp., Minneapolis.
Utility Fan Corporation, Los Angeles.
Vilter Mfg. Company, Milwaukee.
Western Blower Co., Seattle, Wash.
York Corp., York, Pa.

York Corp., York, Pa.

WATERPROOFING

Angier Corporation, Framingham, Mass.

Barrett Division, Allied Chemical & Die Corporation, New Y YES

Barrett Division, Allied Chemical & Die Corporation, New York City.
Carey Mfg. Co., Philip, Lockland, O.
Cheney Metal Products Co., Trenton, N. J.
Eastern States Supply Co., Brooklyn.
Flintkote Co., New York City.
General Insulating Products Co., Brooklyn.
Glidden Company, Cleveland.
Horn Co., A. C., Long Island City, N. Y.
Johns-Manville Sales Corp., New York City.
Koppers Company, Pittsburgh.
Lehon Company, Chicago.
Nebel Manufacturing Co., Cleveland.
Primoid Products Corp., New York City.
Reilly Tar & Chemical Corporation, Indianapolis, Ind. (Compounds) Reilly Tar & Chemical Corporation, Indianap pounds)
Ruberold Co., New York City.
Sisalkraft Co., Chicago.
Sonneborn Sons, Inc., L., New York City.
Southport Paint Co., Savannah, Ga.
Troch Brothers, Inc., Elm Park, S. I., N. Y.
Truscon Laboratories, Detroit.
X-Pando Corporation, Long Island City, N. Y.

WATERPROOFING COMPOUNDS

See Compounds, Waterproofing

WATER HEATERS

See Coils, Fire Pot, Hot Water

WELDERS, ARC

Air Reduction Sales Company, New York City. Allied Weld Crafts, Inc., Indianapolis. Allis-Chalmers Manufacturing Company, Milwaukee.

Allied Weld Crafts, Inc., Indianapolis.
Allis-Chalmers Manufacturing Company, Milwaukee.
Borm Manufacturing Company, Elgin, Ill.
Coddington Manufacturing Co., E. D., Milwaukee.

• Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Emerson Electric Mfg. Co., St. Louis. (A. C.)
Ergolyte Mfg. Co., Philadelphia.
Fern, Ralph, Scranton, Pa.
General Equipment Co., Wichita, Kan.
General Electric Mfg. Co., Wichita, Kan.
General Electric Mfg. Co., Kansas City, Mo.
Hampotn Electric Mfg. Co., Cakmont, Pa.
Harnischfeger Corp., Milwaukee. (Electric)
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Hobart Brothers Co., Troy, O.
Hollup Corp., Div. National Cylinder Gas Co., Chicago.
Ideal Electric & Mfg. Co., Mansfield, O.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland.
Maple Valley Mfg. Co., Mapleton, Ia.
Marquette Manufacturing Co., Inc., Minneapolis. (A. C.)
Miller Electric Mfg. Co., Inc., Appleton, Wis. (Portable)
National Cylinder Gas Co., Chicago.
Pler Equipment Mfg. Co., Benton Harbor, Mich.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis.
Star Electric Motor Co., Bloomfield, N. J.
Trindl, Inc., Jos. H., Chicago.
Una Welding, Incorporated, Cleveland. (Automatic Shielded Arc
Welding)
Universal Power Corporation, Cleveland.

Welding) Universal Power Corporation, Cleveland. Welding Apparatus Co., Chicago.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A. C.)
Wilson Welder & Metals Co., Inc., New York City.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles.
 Agnew Electric Co., Milford, Mich.
 Alphil Spot Welding Co., New York City.

Alphil Spot Welding Co., New York City.
Coddington Manufacturing Co., E. D., Milwaukee.
Dyer Welder & Engineering Co., Kansas City, Mo.

Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Federal Machine & Welder Co., Warren, O.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Micro Products Co., Chicago.
Pler Equipment Manufacturing Co., Benton Harbor, Mich. (Foot operated and motor driven)
Taylor-Hall Welding Corp., Worcester, Mass.
Taylor-Winfield Corp., Warren, O. (Butt and Seam)
Thomson-Gibb Electric Welding Co., Lynn, Mass.

Universal Power Corporation, Cleveland. Weldex, Inc., Detroit.
Westinghouse Electric & Manufacturing Co., East Pittsburgh

WELDING COMPOUNDS

See Compounds, Welding

WELDING EQUIPMENT, OXY-ACETYLENE

Air Reduction Sales Co., New York City. Allied Weld-Craft, Inc., Indianapolis. Atlas Welding Accessories Co., Detroit 21. Automatic Gasflux Mfg. Co., Mansfield, O. Bastian-Blessing Co., Chicago. Burdett Mfg. Co., Chicago. Dockson Corporation, Detroit. Ergolyte Manufacturing Co., Philadelphia. Ergolyte Manufacturing Co., Philadelphia.

Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Jewel Mfg. Co., St. Paul, Minn.
Linde Air Products Co., The, New York City.
Marquette Manufacturing Co., Inc., Minneapolis.
Milburn Co., Alexander, Baltimore, Md.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Ransome Machinery Co., Industrial Div., Dunellen, N. J. (Welding Positioner) ing Positioner) Reiner & Campbell Co., Inc., Elizabeth, N. J.
Smith Welding Equipment Corp., Minneapolis.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Co., San Francisco.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.

> WELDING ROD See Rod, Welding

WELDING TORCHES

See Torches, Brazing, Cutting, Welding

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.

Advance Aluminum Castings Corp., Chicago.
Air Controls, Inc., Cleveland.

Bayley Blower Co., Milwaukee.
Bishop & Babcock Mfg. Co., Cleveland.
Champlon Blower & Forge Co., Lancaster, Pa.

Clarage Fan Co., Kalamazoo, Mich.,
Economy Electric Manufacturing Co., Cicero, Ill.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Janette Mfg. Co., Chicago.

Lau Blower Co., Dayton, O.

Morrison Products, Inc., Cleveland.
New York Blower Co., Chicago.
Peerless Electric Co., Warren, O.

Schwitzer-Cummins Company, Indianapolis.
Sturtevant Co., B. F., Hyde Park, Boston.
Torrington Mfg. Co., Torrington, Conn.

Triangle Mfg. Co., Oshkosh, Wis.

U. S. Air Conditioning Corp., Minneapolis.

Utility Fan Corporation, Los Angeles.

Viking Air Conditioning Corp., Cleveland,
Western Blower Company, Seattle, Wash.

Western Blower Company, Seattle, Wash.

WINDOW FANS

See Fans, Window

WINDOWS, HEAT INSULATING

Advance Insulating Co., Pittsburgh. Advance Insulating Co., Fittsburgh.
Andersen Corp., Bayport, Minn.
Bache & Co., Semon, New York City.
Chamberlin Metal Weather Strip Co., Detroit.
Detroit Steel Products Co., Detroit.
Kane Mfg. Corp., Kane, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O. Mississippi Glass Company, New York City. Russell Co., F. C., Cleveland. Truscon Steel Co., Youngstown, O.

WINDOWS, HOLLOW METAL

American Sheet Metal Works, New Orleans. Biersach & Neidermeyer Co., Milwaukee. Herrmann & Grace.Co., Brooklyn.
International Steel Co., Evansville, Ind. Jamestown Metal Corp., Jamestown, N. Y. Kawneer Co., Niles, Mich.
Newman Brothers, Inc., Cincinnati.
Perkinson & Brown, Chicago.
Russell Co., F. G., Cleveland.
Truscon Steel Co., Youngstown, O.
Willis Steel Corporation, Galesburg, Ill.

WIRE GLASS See Glass, Wire

WIRE, PLAIN, GALVANIZED AND COPPERED

Allegheny Ludlum Steel Corp., Brackenridge, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh. (Aluminum)
American Nickeloid Co., Peru, Ill. (Chrome, nickel coated)
American Steel & Wire Co., Cleveland.
Angell Nail & Chaplet Co., Cleveland.
Atlantic Steel Company, Atlanta, Ga.
Berger Mfg. Div. Republic Steel Corp., Canton, O.

Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized)
California Wire Cloth Corp., Oakland, Calif.

Columbia Steel Co., San Francisco.

Continental Steel Corp., Kokomo, Ind. (Plain galvanized steel)
Copperweld Steel Co., Glassport, Pa.

Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh. (Galvanized)
Laclede Steel Co., St. Louis.
Page Steel & Wire Div., Monessen, Pa.
Republic Steel Corp., Cleveland. (Steel)
Roebling's Sons Co., John A., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, O.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wheeling Corrugating Co., Wheeling, W. Va.
Wickwire Spencer Steel Co., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRING MACHINES

See Machines, Wiring

WRENCHES (SOCKET, OPEN END)

Lowell Wrench Co., Worcester, Mass. Snap-On Tools Corporation, Kenosha, Wis.

A

Section of

American Artisan

1944 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

Section 2-TRADE NAMES

A

- AAF—Air Filters. American Air Filter Co., Inc., Louisville, Ky.
- ABC—Blower-Washer units. American Blower Corp., Detroit.
- ABC—Air Conditioning Furnaces, Water Heaters, Oil Burners, Automatic Burner Corp., Chicago, Ill.
- ACB—Metal Protecting Paint. Tropical Paint & Oil Co., Cleveland.
- A/C—Washable Filters. American Air Filter Co., Inc., Louisville, Ky.
- A-P Dependable Controls. Automatic Products Company, Milwaukee.
- AMS—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
- A-P Controls, Damper Regulators, Motors, Thermostats, Valves, Automatic Products Co., Milwaukee, Wis.
- A.R.A. Asbestos Return Air Sheets. Grant Wilson, Inc., Chicago.
- ASBO Ventilators. American Steel Band Co., Pittsburgh.
- ate—Timing Systems. Automatic Temperature Control Co., Inc., Philadelphia.
- "A. W."—Plates and Sheets. Alan Wood Steel Co., Conshohocken, Pa.
- Abrasoweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Acco-Lastic—Caulking Compounds. Accurate Metal Weather Strip Co., New York, N. Y.
- Ace—Arc and Spot Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.

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- Acid-Proof-Insulating Cement. Quigley Company, New York City.
- Acolite (Bakelite)—Enamels. Acorn Refining Co., Cleveland, O.
- Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Activ-Air—Air Conditioning Furnaces. Heil Co., Milwaukee, Wis.
- Activ-Flame Oil Burners. Heil Co., Milwaukee, Wis,
- Adacast—Refractories. Botfield Refractories Co., Philadelphia.
- Adamant—Insulating Cement. Botsfield Refractories Co., Philadelphia.
- Adapatch Refractories, Botfield Refractories Company, Philadelphia, Pa.
- Ada-Stic-Insulating Cement. Botsfield Refractories Co., Philadelphia, Pa.
- Adjusto-Fire Pot Coils. Radiator Specialty Co., Charlotte, N. C.
- Aeracool—Fan Blades, Fans, Louvres and Shutters, Ventilators. Myers Electric Co., Pittsburgh, Pa.

- Aerisweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Aerocrat—Blowers, Louvres, Washers. W. R. Ames Co., San Francisco, Cal.
- Aero Flo-Fans, Ventilators. George B. Klee Co., Cincinnati, O.
- Aerofuse Air Diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
- Aerolux—A. C. Furnaces. S. T. Johnson Co., Oakland, Cal.
- Aeropel—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.
- Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aeropiex—Blowers. Bayley Blower Co., Milwaukee, Wis.
- Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aerospot-Fans. South Bend Air Products, Inc., South Bend, Ind.
- Aerovalve—Ventilators. Knowles Mushroom Ventilator Co., Montelair, N. J.
- Afee Blowers, Blower-Filters, Furnaces and Stokers. American Furnace Co., St. Louis, Mo.
- Afce "Due Ble"—Horizontal Furnaces.
 American Furnace Co., St. Louis, Mo.
- Afco Master-Gas-Furnaces. American Furnace Co., St. Louis, Mo.
- Affeo Grilles, Louvres, American Foundry & Furnace Co., Bloomington, Ill.
- Agile—Welding Electrodes. American Agile Corp., Cleveland.
- Agitair Air Diffusers. Air Devices, Inc., New York City.
- Airacoustic Insulation. Johns-Manville, New York City.
- Airate-Ventilators. Aeolus Dickinson, Chicago.
- Air-A-Way Ventilators. American Metal Products, Fort Worth, Tex.
- Airboy-Blower Filter. The Peerless Electric Co., Warren, Ohio.
- Aircell Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown. Pa.
- Airce Electrodes, Soldering Flux Welding Rod. Torches and Welding Equipment. Air Reduction Sales Co., New York City.
- Air-Con—Heating & Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Air Control—Air Conditioning Units, Bearings, Blowers, Blower-Filters, Blower Housings and Wheels. Hastings Air Conditioning Co., Inc., Hastings, Nebr.

- Air-Dux-Prefabricated Ducts and Fittings. Wood Industries, Inc., Gar, Detroit.
- Aire-Flo Furnaces. Lennox Furnace Co., Marshalltown, Ia.
- Air-X-Hauster-Ventilators. G. C. Breidert Co., Los Angeles.
- Aire-RAY-ater Furnaces. Ray Oil Burner Co., San Francisco.
- Airex—Air Conditioning Units, Blowers and Fans. Mountain States Equipment Co., Denver, Colo.
- Airfle—Pipe, Fittings and Accessories. Milcor Steel Co., Milwaukee.
- Airfle Furnaces. Aladdin Heating Corp., Oakland, Cal.
- Air-Fan-Window Ventilators. Reliable Sheet Metal Engineering Co., Chicago.
- Air-Flo-Ventilators. Belanger Fan &
- Blower Co., Detroit.

 Air Flo-Ventilators. Aeolus Dickinson, Chicago.
- Airfoil—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.
- Air Force—Attic Fan. Vulcan Metal Products Co., Birmingham, Ala.
- Airguide—Hygrometers and Thermometers. Fee & Stemwedel, Inc., Chicago, Ill.
- Airidge Ridge Ventilators. Acolus Dickinson, Chicago.
- Aristocrat Fan Blades. Torrington Mfg. Co., Torrington, Conn.
- Airjecter-Ventilators. Swartwout Co., Cleveland.
- Air Koeler—Evaporative Conditioners. Utility Fan Corporation, Los Angeles.
- Air Lader—Louvers and Shutters. Edwin F. Guth Co., St. Louis.
- Air-Lift Blowers and Fans. Mauer Engineering, Evanston, Ill.
- Airline—Furnaces. Joliet Heating Corp., Joliet, Ill.
- Airline—Registers & Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
- Airline Ventilators. Danzer Metal Works Co., Hagerstown, Md.
- Airlok-Mineral Wool. Plastergon Wall Board Co., Buffalo.
- Air-Marvel—Fans. General Blower Co., Philadelphia, Pa.
- Air Master—Buffer-Grinder. Cincinnati Electrical Tool Co., Cincinnati.
- Airmaster—Blowers and Suction Cleaners. Skilsaw, Inc., Chicago.
- Airmat—Filters, American Air Filter Co., Inc., Louisville, Ky.
- Airmover-Blowers. Skuttle Mfg. Co., Detroit.

WATER HEATERS

See Coils, Fire Pot, Hot Water

WELDERS, ARC

Air Reduction Sales Company, New York City. Allied Weld Crafts, Inc., Indianapolis.

Allied Weld Crafts, Inc., Indianapolis.
Allis-Chalmers Manufacturing Company, Milwaukee.
Borm Manufacturing Company, Elgin, Ill.
Coddington Manufacturing Co., E. D., Milwaukee.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Emerson Electric Mfg. Co., St. Louis. (A. C.)
Ergolyte Mfg. Co., Philadelphia.
Fern, Ralph, Scranton, Pa.
General Equipment Co., Wichits, Kan. Ergolyte Mfg. Co., Philadelphia.
Fern, Ralph, Scranton, Pa.
General Equipment Co., Wichita, Kan.
General Electric Co., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hampton Electric Mfg. Co., Oakmont, Pa.
Harnischfeger Corp., Milwaukee. (Electric)
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Hobart Brothers Co., Troy, O.
Hollup Corp., Div. National Cylinder Gas Co., Chicago.
Ideal Electric & Mfg. Co., Mansfield, O.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland.
Maple Valley Mfg. Co., Mapleton, Ia.
Marquette Manufacturing Co., Inc., Minneapolis. (A. C.)
Miller Electric Mfg. Co., Inc., Appleton, Wis. (Portable)
National Cylinder Gas Co., Chicago.
Pier Equipment Mfg. Co., Benton Harbor, Mich.
Sight Feed Generator Co., Richmond, Ind.
Smith Welding Equipment Corp., Minneapolis.
Star Electric Motor Co., Bloomfield, N. J.
Trindl, Inc., Jos. H., Chicago.
Una Welding, Incorporated, Cleveland. (Automatic Shielde

Trindi, Inc., Jos. H., Chicago.
Una Welding, Incorporated, Cleveland. (Automatic Shielded Arc Welding)

• Universal Power Corporation, Cleveland.
Welding Apparatus Co., Chicago.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A. C.)
Wilson Welder & Metals Co., Inc., New York City.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles.
Agnew Electric Co., Milford, Mich.
Alphil Spot Welding Co., New York City.
Coddington Manufacturing Co., E. D., Milwaukee.
Dyer Welder & Engineering Co., Kansas City, Mo.
Eisler Engineering Co., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Federal Machine & Welder Co., Warren, O.
Hercules Electric & Mfg. Co., Inc., Brooklyn.
Micro Products Co., Chicago.
Pier Equipment Manufacturing Co., Benton Harbor, Mich. (Foot operated and motor driven) operated and motor driven)
Taylor-Hall Welding Corp., Worcester, Mass.
Taylor-Winfield Corp., Warren, O. (Butt and Seam)
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Universal Power Corporation, Cleveland.
Weldex, Inc., Detroit.

Westinghouse Electric & Manufacturing Co., East Pittsburgh.

WELDING COMPOUNDS

See Compounds, Welding

WELDING EQUIPMENT, OXY-ACETYLENE

Air Reduction Sales Co., New York City. Allied Weld-Craft, Inc., Indianapolis. Atlas Welding Accessories Co., Detroit 21. Atlas Welding Accessories Co., Detroit 21.
Automatic Gasflux Mfg. Co., Mansfield, O.
Bastian-Blessing Co., Chicago.
Burdett Mfg. Co., Chicago.
Dockson Corporation, Detroit.
Ergolyte Manufacturing Co., Philadelphia.
Harris Calorific Co., Cleveland.
Imperial Brass Mfg. Co., Chicago.
Jewel Mfg. Co., St. Paul, Minn.
Linde Air Products Co., The, New York City.
Marquette Manufacturing Co., Inc., Minneapo
Milburn Co., Alexander, Baltimore, Md. Minneapolis. Marquette Manufacturing Co., Inc., Minneapolis.
Milburn Co., Alexander, Baltimore, Md.
Modern Engineering Co., St. Louis.
National Cylinder Gas Co., Chicago.
Ransome Machinery Co., Industrial Div., Dunellen, N. J. (Welding Positioner) Ransome Machinery Co., Industrial Div., Dullellell, A. J. (Westing Positioner)
Reiner & Campbell Co., Inc., Elizabeth, N. J.
Smith Welding Equipment Corp., Minneapolis.
Torchweld Equipment Div., National Cylinder Gas Co., Chicago.
Universal Power Corporation, Cleveland.
Victor Equipment Co., San Francisco.
Wall Chemicals Div., Liquid Carbonic Corp., Chicago.

> WELDING ROD See Rod, Welding

WELDING TORCHES

See Torches, Brazing, Cutting, Welding

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.

Advance Aluminum Castings Corp., Chicago.
Air Controls, Inc., Cleveland.

Bayley Blower Co., Milwaukee,
Bishop & Babcock Mfg. Co., Cleveland.
Champion Blower & Forge Co., Lancaster, Pa.

Clarage Fan Co., Kalamazoo, Mich.,
Economy Electric Manufacturing Co., Cicero, Ill.
Hastings Air Conditioning Co., Inc., Hastings, Nebr.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Janette Mfg. Co., Chicago.

Janette Mfg. Co., Dayton, O.

Morrison Products, Inc., Cleveland.
New York Blower Co., Chicago.
Peerless Electric Co., Warren, O.
Schwitzer-Cummins Company, Indianapolis.
Sturtevant Co., B. F., Hyde Park, Boston.
Torrington Mfg. Co., Torrington, Conn.
Triangle Mfg. Co., Oshkosh, Wis.

U. S. Air Conditioning Corp., Minneapolis.

U. S. Air Conditioning Corp., Minneapolis. Utility Fan Corporation, Los Angeles. Viking Air Conditioning Corp., Cleveland. Western Blower Company, Seattle, Wash.

WINDOW FANS

See Fans, Window

WINDOWS, HEAT INSULATING

Advance Insulating Co., Pittsburgh. Andersen Corp., Bayport, Minn. Bache & Co., Semon, New York City. Chamberlin Metal Weather Strip Co., Detroit. Chamberin Metal weather Strip Co., Detroit Detroit Steel Products Co., Detroit. Kane Mfg. Corp., Kane, Pa. Libbey-Owens-Ford Glass Co., Toledo, O. Mississippi Glass Company, New York City. Russell Co., F. C., Cleveland. Truscon Steel Co., Youngstown, O.

WINDOWS, HOLLOW METAL

American Sheet Metal Works, New Orleans. Biersach & Neidermeyer Co., Milwaukee. Herrmann & Grace.Co., Brooklyn. International Steel Co., Evansville, Ind. Jamestown Metal Corp., Jamestown, N. Y. Jamestown Metal Corp., Jamestown Kawneer Co., Niles, Mich. Newman Brothers, Inc., Cincinnati. Perkinson & Brown, Chicago. Russell Co., F. G., Cleveland. Truscon Steel Co., Youngstown, O. Willis Steel Corporation, Galesburg, Ill.

WIRE GLASS See Glass, Wire

WIRE, PLAIN, GALVANIZED AND COPPERED

Allegheny Ludlum Steel Corp., Brackenridge, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh, (Aluminum)
American Nickeloid Co., Peru, Ill. (Chrome, nickel coated)
American Steel & Wire Co., Cleveland.
Angell Nail & Chaplet Co., Cleveland.
Atlantic Steel Company, Atlanta, Ga.
Berger Mfg. Div. Republic Steel Corp., Canton, O.

Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized)
California Wire Cloth Corp., Oakland, Calif.

Columbia Steel Co., San Francisco.

Continental Steel Corp., Kokomo, Ind. (Plain galvanized steel)
Copperweld Steel Co., Glassport, Pa.

Hussey & Co., C. G., Pittsburgh.
Jones & Laughlin Steel Corp., Pittsburgh. (Galvanized)
Laclede Steel Co., St. Louis.
Page Steel & Wire Div., Monessen, Pa.
Republic Steel Corp., Cleveland. (Steel)
Roebling's Sons Co., John A., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, O.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wheeling Corrugating Co., Wheeling, W. Va.
Wickwire Spencer Steel Co., New York City.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRING MACHINES

See Machines, Wiring

WRENCHES (SOCKET, OPEN END)

Lowell Wrench Co., Worcester, Mass. Snap-On Tools Corporation, Kenosha, Wis.

Section of

American Artisan

1944 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL AIR CONDITIONING AND SHEET METAL PRODUCTS

Section 2-TRADE NAMES

A

- AAF-Air Filters. American Air Filter Co., Inc., Louisville, Ky.
- ABC—Blower-Washer units. American Blower Corp., Detroit.
- ABC—Air Conditioning Furnaces, Water Heaters, Oil Burners, Automatic Burner Corp., Chicago, Ill.
- ACB—Metal Protecting Paint. Tropical Paint & Oil Co., Cleveland.
- A/C-Washable Filters. American Air Filter Co., Inc., Louisville, Ky.
- A-P Dependable Controls. Automatic Products Company, Milwaukee.
- AMS—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
- A-P Controls, Damper Regulators, Motors, Thermostats, Valves, Automatic Products Co., Milwaukee, Wis.
- A.R.A. Asbestos Return Air Sheets. Grant Wilson, Inc., Chicago.
- ASBO Ventilators, American Steel Band Co., Pittsburgh.
- nte—Timing Systems, Automatic Temperature Control Co., Inc., Philadelphia
- "A. W."—Plates and Sheets. Alan Wood Steel Co., Conshohocken, Pa.
- Abrasoweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Acco-Lastic—Caulking Compounds. Accurate Metal Weather Strip Co., New York, N. Y.
- Ace—Arc and Spot Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.
- Acid-Proof-Insulating Cement. Quigley Company, New York City.

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- Acolite (Bakelite)—Enamels. Acorn Refining Co., Cleveland. O.
- Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis. Minn.
- Activ-Air—Air Conditioning Furnaces. Hell Co., Milwaukee, Wis.
- Activ-Flame Oil Burners. Heil Co., Milwaukee, Wis.
- Adacast—Refractories. Botfield Refractories Co., Philadelphia.
- Adamant—Insulating Cement. Botsfield Refractories Co., Philadelphia.
- Adapatch Refractories. Botfield Refractories Company, Philadelphia, Pa.
- Adn-Stic-Insulating Cement. Botsfield Refractories Co., Philadelphia, Pa.
- Adjuste-Fire Pot Coils. Radiator Specialty Co., Charlotte, N. C.
- Aeracool—Fan Blades, Fans, Louvres and Shutters, Ventilators. Myers Electric Co., Pittsburgh, Pa.

- Aerisweid Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Aerocrat—Blowers, Louvres, Washers. W. R. Ames Co., San Francisco, Cal.
- Aero Flo-Fans, Ventilators. George B. Klee Co., Cincinnati, O.
- Aerofuse Air Diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
- Aerolux—A. C. Furnaces. S. T. Johnson Co., Oakland, Cal.
- Aeropel—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.
- Aeroplane-Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aeroplex—Blowers. Bayley Blower Co., Milwaukee, Wis.
- Aeroplane—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aerospot-Fans. South Bend Air Products, Inc., South Bend, Ind.
- Aerovalve—Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J.
- Afee Blowers, Blower-Filters, Furnaces and Stokers, American Furnace Co., St. Louis, Mo.
- Afco "Duo Blo"—Horizontal Furnaces. American Furnace Co., St. Louis, Mo.
- Afco Master-Gas Furnaces. American Furnace Co., St. Louis, Mo.
- Affeo Grilles, Louvres, American Foundry & Furnace Co., Bloomington, Ill.
- Agile—Welding Electrodes. American Agile Corp., Cleveland.
- Agitair Air Diffusers. Air Devices, Inc., New York City.
- Airacoustic Insulation. Johns-Manville, New York City.
- Airate—Ventilators. Aeolus Dickinson, Chicago.
- Air-A-Way Ventilators. American Metal Products, Fort Worth, Tex.
- Airboy-Blower Filter. The Peerless Electric Co., Warren, Ohio.
- Aircell Duct Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.
- Airce Electrodes, Soldering Flux Welding Rod, Torches and Welding Equipment. Air Reduction Sales Co., New York City.
- Air-Con—Heating & Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Air Control—Air Conditioning Units, Bearings, Blowers, Blower-Filters, Blower Housings and Wheels. Hastings Air Conditioning Co., Inc., Hastings, Nebr.

- Air-Dux—Prefabricated Ducts and Fittings. Wood Industries, Inc., Gar, Detroit.
- Aire-Flo Furnaces. Lennox Furnace Co., Marshalltown, Ia.
- Air-X-Hauster-Ventilators. G. C. Breidert Co., Los Angeles.
- Aire-RAY-ator Furnaces. Ray Oil Burner Co., San Francisco.
- Airex—Air Conditioning Units, Blowers and Fans. Mountain States Equipment Co., Denver, Colo.
- Airflo-Pipe, Fittings and Accessories.
 Milcor Steel Co., Milwaukee.
- Airfie Furnaces. Aladdin Heating Corp., Oakland, Cal.
- Air-Fan-Window Ventilators. Reliable Sheet Metal Engineering Co., Chicago.
- Air-Flo-Ventilators. Belanger Fan & Blower Co., Detroit.
- Air Fie-Ventilators. Aeolus Dickinson,
- Airfeil—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.
- Air Force—Attic Fan. Vulcan Metal Products Co., Birmingham, Ala.
- Airguide—Hygrometers and Thermometers. Fee & Stemwedel, Inc., Chicago, Ill.
- Airidge Ridge Ventilators. Acolus Dickinson, Chicago.
- Aristocrat Fan Blades. Torrington Mfg. Co., Torrington, Conn.
- Airjector-Ventilators. Swartwout Co., Cleveland.
- Air Koeler—Evaporative Conditioners. Utility Fan Corporation, Los Angeles.
- Air Lader—Louvers and Shutters. Edwin F. Guth Co., St. Louis.
- Air-Lift Blowers and Fans. Mauer Engineering, Evanston, Ill.
- Airline—Furnaces. Joliet Heating Corp., Joliet. Ill.
- Airline—Registers & Grilles. Tuttle & Bailey, Inc., New Britain. Conn.
- Airline Ventilators. Danzer Metal Works Co., Hagerstown, Md.
- Airlok-Mineral Wool. Plastergon Wall Board Co., Buffalo.
- Air-Marvel—Fans. General Blower Co., Philadelphia, Pa.
- Air Master—Buffer-Grinder. Cincinnati Electrical Tool Co., Cincinnati.
- Airmaster—Blowers and Suction Cleaners. Skilsaw, Inc., Chicago.
- Airmat—Filters, American Air Filter Co., Inc., Louisville, Ky.
- Airmover-Blowers. Skuttle Mfg. Co., Detroit.

- Air-O-Matie Air Conditioning Units.
 Williams Oil-O-Matic Htg. Corp., Bloomington, Ill.
- Airo-Flex-Directional Flow Registers. Auer Register Co., Cleveland.
- -Blower Wheels. Mfg. Co., Torrington, Conn.
- Air-Pak-Blower-Filter Units. Air Controls, Inc., Cleveland.
- Filters. Davies Air Filter Corp., New York, N. Y.
- Airpyrator Blowers. Burnwell Corp., Allentown, Pa.
- Air-Seel-Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.
- -Controls. Minneapolis-Honeywell Regulator Co., Minneapolis.
- Airstream Blower Wheels. Morrison Products, Inc., Cleveland.
- Airstream-Filters. A. G. Brauer Supply Co., St. Louis.
- Roof Ventilators. Gallaher Co., Owatonna, Minn
- Air-Vane-Registers. Rock Island Register Co., Rock Island, Ill.
- vule—Concrete Waterproofing Paint. elf-Vulcanizing Rubber Co., Inc., Chicago, Ill.
- Air-X-Hauster-Ventilators. G. C. Breidert Co., Los Angeles.
- Prefabricated Ducts, Fittings Ajax -Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati.
- Akron Air Blast-Furnaces. May-Fieberger Co., Newark, Ohio.
- Albron Aluminum Paint. Aluminum company of America, Pittsburgh.
- Alclad-Sheets. Aluminum Company of America, Pittsburgh.
- Aluminum Products. Aluminum Co. of America, Pittsburgh, Pa.
- Alkacite Paint. Protective Coatings. Incorporated, Detroit.
- All-Alloy Shears. Bremil Mfg. Co.,
- Allen-Flux-Soldering Flux. L. B. Allen Co., Inc., Chicago.
- Allkote . - Paint, Acme Refining Co., Cleveland.
- All-Sel-Flux. L. B. Allen Co., Chicago.
- Alltite Insulation. Coast Insulating Corp., Los Angeles.
- All-Weather Roof Cement, Caulking and Waterproofing Compounds, Roofing Paint. Ford Roofing Products ing Paint. Ford Company, Chicago.
- ma Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Alma
- Almar-Hand Slitting Machines. Ward Machinery Co., Chicago, Ill.
- Almetal-Fire Doors, Merchant & Evans Co., Philadelphia, Pa.
- Alnor—Thermometers, Illinois Testing Laboratories, Inc., Chicago, Ill.
- Alumaweld-Flux and Solder. Lloyd S. Johnson Co., Chicago.
- Alumbrite Paint. Thompson & Co., Pittsburgh, Pa.
- Alumi-Flux-Soldering Flux. L. B. Allen Co., Chicago, Ill.
- Metal Cleaner, NuSteel Alumin-nu -Company, Chicago.
- Alumi-Soder--Aluminum Solder. L. B Allen Co., Chicago.

- Aluminweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Always Reliable Soldering Furnaces, Mallets, Torches. Otto Bernz Co., Rochester, N. Y.
- mco-Flux, American Solder & Flux Co., Philadelphia, Pa.
- Amerock Cabinet and Casing Hard-ware. American Cabinet Hardware Corp., Rockford, Ill.
- Aminco-Anemometers. American Instrument Co., Silver Spring, Md.
- -Air Filters, Amirton Co., Elmsford, N. Y.
- Welders. Allis-Chalmers Mfg. Co., Milwaukee.
- Ampco-Blow Pipe Collectors. American Metal Products Co., Fort Worth, Tex.
- -Blowers. American Machine Products Co., Marshalltown, Ia.
- Gas Burner. Surface Com-Amplifire bustion, Toledo, Ohio.
- Anaconda—Copper and Brass Products. American Brass Co., Waterbury, Conn.
- nchor Hangers. Royal-Apex Mfg. Corp., Brooklyn, N. Y.
- Anchor Brand—Soldering Flux. Garden City Laboratory, Inc., Chicago.
- Anchor Brand-Nails, Rivets. Townsend Co., New Brighton, Pa.
- Anchor-Kolstoker Stoker-fired Fur naces and Stokers. Anchor Stove & Range Co., New Albany, Ind.
- nchortite Nails. Dickson Weather-proof Nail Co., Evanston, Ill.
- Anderson-Spray Nozzles. B. F. Sturtevant Co., Hyde Park, Mass.
- Annite-Metal Polisher. Quigley Company, Inc., New York City.
- node—Arc Welding Electrodes. Lin-coln Electric Co., Cleveland, O. Anode-
- Welding Wolfe-Kote Co., Sheboygan, Wis.
- -Metal Protecting Paint. Pont de Nemours & Company, mington, Del.
- Apartvent—Window Ventilating Fans. Autovent Fan & Blower Div., Herman Nelson Corp., Chicago.
- Apeo-Caulking Compounds, Paint. Asphalt Products Co., Syracuse, N. Y.
- Apex-Furnaces. Excelsior Steel Furnace Co., Chicago.
- -Furnaces & Heaters. Supply Co., Sacramento, Cal.
- Apex-Quadrants. Ohio Products Co., Cleveland, O.
- Apex—Hangers, Elbows and Fittings. Royal-Apex Mfg. Co., Brooklyn.
- Apex Exl-Air-Furnaces. Excelsior Steel Furnace Co., Chicago,
- Paint. Dampney Co. of Amer-Apexlorica, Hyde Park, Boston, Mass.
- Apolloy Copper Steel. Apollo Steel Company, Apollo, Pa.
- Appton Super Pneumatic Hammer. Brown-Appton Company, New City.
- Aqua Bar-Roof Cement. Continental Products Co., Euclid, O.
- Aqua-Flo-Pumps. The Heil Co., Milwaukee.
- Aqua-Master-Water Heaters. Century Eng. Corp., Cedar Rapids, Ia.

- Aquanil-Waterproofing Paint. Protective Coatings, Incorporated, Detroit.
- Aqua-Scale-Automatic Humidifier. P. Glasby Mfg. Co., Bloomfield, N. J.
- Aquiux—Water Heaters. S. T. Johnson Co., Oakland, Cal. Arc-Eng Air Conditioning Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- rehitex Venetian Blinds. Chicago Venetian Blind Co., Chicago.
- Americar - Oil Burners. & Standard Sanitary Corp., Pittsburgh, Pa.
- Arctic-Air Conditioning Units. Premier urnace Co., Dowagiac, Mich.
- -Ventilators. Arex Company, Chicago.
- Arin Accelerant-Louvers and Shutters. Arex Co., Chicago,
- Arin Stationary-Louvers and Shutters. Arex Co., Chicago.
- Aristocrat Gravity Registers. Auer Register Co., Cleveland, O.
- Plates, Sheets. American Rolling Mill Co., Middletown, O.
- -Roofing and Sheets. Armeo Ingot Iron American Rolling Mill Co., Middletown, O.
- -Glazing Compounds. Armstrong Co., Detroit.
- -Paint. Carter Paint Co., Lib-Armorize erty, Ind.
- -Compressors. General Ma-Armstrongchinery Co., Spokane, Wash.
- Dowagiac Steel Arrow Gas--Furnaces. Furnace Co., Dowagiac, Mich.
- Arrewtrel Heating and Ventilating Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Arteraft-Blowers and Furnaces. Chicago Steel Furnace Co., Chicago, Ill.
- -Flux. American Solder & Flux Co., Philadelphia, Pa.
- Asbestocel—Furnace Insulation. Johns-Manville, New York City.
- Asbestocite—Duct Board, Johns-Man-ville, New York City.
- Ventilators. American Steel Band Co., Pittsburgh.
- matic Switch Co., New York, N. Y. Auto-
- Furnaces. May-Fiebeger Co., Newark, Ohio.
- tomist—Humidifiers. American Foundry & Furnace Co., Bloomington, In.
- ttic Louvers—Ventilators. Air Control Products, Inc., Coopersville, Mich. Attic Louvers
- Attievane-Attic Fans. B. F. Sturtevant Co., Boston.
- Auto-Humidifier Valves. Maid-O'-Mist, Inc., Chicago.
- Autoceal-Stokers. Crane Co., Chicago.
- Autocrat-Fan Blades, Torrington Mfg. Co., Torrington, Conn. Autocrat-Oil Burners. Chandler Company, Cedar Rapids, Iowa.
- Automatic-Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.
- Automatic June Humidifiers, Monmouth Products Company, Cleveland.
- Autovent-Blowers, Fans, Louvers & Shutters, Ventilators, Herman Nelson Corporation, Moline, Ill.

Aviation—Snips. Penn Tool Co., Philadelphia.

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Axisto - Fans. B. F. Sturtevant Co., Boston.

Axiom—Filters. Blockson & Company, Michigan City, Ind.

B

BB—Blast Gates, Roof Clips, Damper Clips and Tips, Conductor Fittings and Accessories, Snow Guards, Berger Brothers Company, Philadelphia.

B & B — Fans, Louvers & Shutters, Blower Wheels. Bishop & Babcock Mfg. Co., Cleveland.

BCA—Ball Bearings. Bearing Co. of America, Lancaster, Pa.

BE — Blowers, Blower-Filters, Fans. Barrett Engineers, Cleveland Heights, Ohio.

B. F. C.—Gas Burners. Moncrief Furnace & Mfg. Co., Dallas, Tex.

B-H-Insulating Cement. Baldwin-Hill Co., Trenton, N. J.

B-H Weatherseal—Waterproofing Compound. Baldwin-Hill Co., Trenton, N. J.

B & W-Refractories & Stokers. Babcock & Wilcox Co., New York City.

Badger-Filters. Air Devices, Inc., New York City.

Badger—Time Switches. Reliance Automatic Lighting Co., Racine, Wis.

Baer Brothers, New York City.

Baffle Mix-Refractories. Walsh Refractories Corp., St. Louis.

Ballard—Furnaces, Oil Burners, Gilbert & Barker Mfg. Co., West Spring-

Balsam - Wool — Flexible Insulation. Wood Conversion Co., St. Paul.

Bankheat—Oil Burners. S. T. Johnson Co., Oakland, Cal.

Bantam — Motors. Small Motors, Inc., Chicago.

Bar-Brook—Fans, Evaporative Coolers. Shreveport Eng. Co., Inc., Shreveport, La.

Bardamp — Waterproofing Compounds. Acorn Refining Company, Cleveland.

Barlastie—Caulking Compounds. Barland Weatherstrip Material Co., Cleveland.

Barreled Sunlight—Paint and Enamel. U. S. Gutta Percha Paint Co., Providence, R. I.

Barry—Pillow Blocks, Pulleys. R. & J. Dick Co., Inc., Passaic, N. J.

Barthel — Soldering Furnaces and Torches. Van Praag Sales, New York City.

Barton—Blower-Filters, Furnace Blowers, Cabinets and Casings, Air Conditioning and Gravity Furnaces, Heaters, Housings and Stampings. National Mfg. & Engineering Co., Detroit.

Basmor — Air Conditioning Furnace. Bastian - Morley Co., Inc., LaPorte, Ind.

Battery-Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Bear Cat-Booster Fans. Midwestern Supply Co., Bloomington, Ill.

Beaver-Furnaces and Heaters. Danville Stove & Mfg. Co., Danville, Pa. Beckett Commodore — Oil Burners. R. W. Beckett Eng. Co., Elyria, O.

Beehive—Roofing. Samuel Cabot, Inc., Boston, Mass.

Beloit-Machines, Punches, Tools. Hendley & Whittemore Co., Beloit, Wis.

Bemis — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Benda-Vane — Registers. Rock Island Register Co., Rock Island, Ill.

Bend - Exy — Grilles and Registers.
Standard Stamping & Perforating
Co., Chicago.

Bengal — Furnaces. Floyd-Wells Co., Royersford, Pa.

Berloy — Building Products, Berger Mfg. Co., Div. Republic Steel Corp., Canton, O.

Berry-Cel-Insulation. F. E. Berry & Co., Everett, Mass.

Bertossa-Furnaces. Jackson & Church Co., Saginaw, Mich.

Best-Cast Iron Chimney Caps. Sterling Foundry Co., Sterling, Ill.

Beth-Cu-Ley-Sheets. Bethlehem Steel Co., Bethlehem, Pa.

Bethlehem Doe-Oil Burners, Bethlehem Fdy. & Mach. Co., Bethlehem, Pa.

Betterbuilt -- Registers. Air Control Products, Inc., Coopersville, Mich.

Big Sieux—Furnaces. Iowa Foundry Co., Sioux City, Iowa.

Bildrite—Sheathing. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis.

Biltwel—Furnaces. Fraser & Johnston Co., San Francisco.

BI-MIX-Gas Burners. John Zink Co., Tulsa, Okla.

Bitumastic No. 50 — Compounds and Paint. Wailes Dove-Hermiston Corp., Westfield, N. J.

Bitumastic Black Solution — Paint. Walles Dove-Hermiston Corp., West-, field. N. J.

Bitumastic 70 B — Enamel. Wailes
Dove-Hermiston Corporation, Westfield. N. J.

Bituseal—Paint. Cheesman-Elliot Co., Inc., Brooklyn.

Black Diamond—Built-up Roofing, Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Black Diamond — Furnaces, Heaters.
Maple City Furnace Co., Monmouth,
Ill.

Black Diamond-Stokers. Beckley Perforating Co., Garwood, N. J.

Blo-Aire—Blower-Filter Units. Meyer Furnace Co., Peoria, Ill.

Blowertrel — Thermostatic Hydraulic Control. White Mfg. Co., St. Paul.

Blowerte — Blower-Filter Units. Lau Blower Co., Dayton, Ohio.

Bluebird—Snips. Bergman Tool Mfg Co., Buffalo.

Blue Coal—Conversion Grates. Delaware, Lackawanna & Western Coal Co., New York City.

Blue Flame—Rotary Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

Blue Knight—Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J. Blue - Point — Drills, Tools. Snap - on Tools Corp., Kenosha, Wis.

Blue Ridge—Wire Glass. Libbey-Owens-Ford Glass Co., Toledo, Ohio.

BNCO — Metal Windows, Doors, Skylights, Welding and Sheet Metal Work. Biersach & Neidermeyer Co., Milwaukee, Wis.

Boiler Plate — Furnaces. Williamson Heater Co., Cincinnati, O.

Bonderizing-Metal processes. Parker Rust-Proof Co., Detroit.

Eqomer—Furnaces. Heaters. Hess-Snyder Co., Massilon, O.

Boost-Aire—Fans. L. J. Mueller Furnace Co., Milwaukee.

Bower—Bearings. Ahlberg Bearing Co., Chicago.

Branford-Oil Burners. Malleable Iron Fittings Co., Branford, Conn.

Brazare Electrodes. Universal Power Corporation, Cleveland.

Brees-Air — Fans. Buffalo Forge Co., Buffalo, N. Y.

Breese Hydroxilating-Oil Burners. Oil Devices, Chicago.

Breezo-Kitchen Exhaust Fans. Buffalo Forge Co., Buffalo, N. Y.

Brevelite—Crackle Finish Paint. Zapon Division Atlas Powder Co., North Chicago, Ill.

Brilliant Fire — Floor Furnaces and Heaters. Ohio Foundry and Mfg. Co., Steubenville, O.

Brillien—Furnaces, Heaters. Stainless & Steel Products Co., St. Paul, Minn.

Bronzend — Electrodes. Arcos Corp., Philadelphia.

Brookceil — Metal Ceilings, Brooklyn Metal Ceiling Co., Brooklyn, N. Y.

Brownskin-Waterproof Sheathing Paper. Angier Corp., Framingham,

Bull Dog-Snips and Shears. Wiss & Sons Co., Newark, N. J.

Bumble Bee-Welder. Wilson Welder & Metals Co., Inc., New York City.

Bung-Lo-Warm Air Furnaces. Geo. J. Cocking, Santa Ana, Cal.

Bunker Hill-Roofing, Sheets and Solder. Northwest Lead Co., Seattle, Wash.

Burks—Super Turbine Pumps. Decatur Pump Co., Decatur, Ill.

Burner-Set—Castable Refractory. Plibrico Jointless Firebrick Co., Chicago.

Burnham-Pumps. Union Steam Pump Co., Battle Creek, Mich.

Butler—Furnaces. Ramey Mfg. Co.. Columbus, O.

Butler-Stokers. Eddy Stoker Corporation, Chicago.

But-N-tite — Steel Roofing. St. Paul Corrugating Co., St. Paul.

Buzzer — Gas Soldering Furnaces. Charles A. Hones, Inc., Baldwin, N. Y.

C

CDC — Bearings, Couplings, Pulleys. Chicago Die Casting Company, Chicago.

C-H — Relays, Switches and Valves. Cutler - Hammer, Inc., Milwaukee, Wis.

CID-Pumps, Goulds Pumps, Inc., Seneca Falls, N. Y.

- C J B-Bearings. Ahlberg Bearing Co., Chicago.
- CP-Electric Tools. Chicago Pneumatic Tool Co., New York City.
- C-10—High Temperature Paint. Laclede-Christy Clay Products Co., St. Louis:
- Calktite Caulking Compounds, U. S. Stoneware Co., Akron, Ohio.
- Caloric Furnaces. Marshall Furnace Co., Marshall, Mich.
- Calorider—Air Conditioning Units. General Air Conditioning Corp., Cincinnati.
- Calwico—Machinery Guards and Wire Cloth. California Wire Cloth Corp., Oakland. Cal.
- Camel Valves. C. L. Bryant Corp., Cleveland. O.
- Cantilever Hygrometers. Standard Thermometer, Inc., Boston.
- Capillary—Air Conditioning Units, Filters, Washers. Air & Refrigeration Corp., New York City.
- Capital—Furnaces. Farris Furnace Co., Springfield, Ill.
- Capitol Rock Wool-Insulation. Standard Lime & Stone Co., Baltimore.
- Capitolaire Furnaces. United States Radiator Corp., Detroit.
- Carbonaire Oil Burners. Aldrich Co., Wyoming, Ill.
- Carend—Electrodes. Arcos Corp., Philadelphia.
- Careycel-Insulation. Philip Carey Co., Lockland, Ohio.
- Careyclad Metal Protecting Paint. Philip Carey Mfg. Co., Lockland, O.
- Careyduct Prefabricated Ducts and Fittings, Philip Carey Co., Lockland,
- Carter-Oil Burners. General Oil Heating Corp., West New York, N. J.
- Carton Economy Furnaces. International Heater Co., Utica, N. Y.
- Castalu—Blower Wheels and Fans. Advance Aluminum Castings Corp., Chicago, Ill.
- Castirnare—Electrodes. Universal Power Corp., Cleveland.
- Castolin Autochemic Soldering Flux. Eutectic Welding Alloys Co., New York City.
- Castolin Eutectie Electrodes and Welding Rod. Eutectic Welding Alloys Co., New York City.
- Caulk-O-Seal Caulking and Glazing Compounds. Calbar Paint & Varnish Co., Philadelphia, Pa.
- Cauxeal Compounds. X-Pando Corporation, Long Island City, N. Y.
- Cello-Sponge-Evaporators. Viking Air Conditioning Corp., Cleveland.
- Cell-U-Blanket Insulation. Masonite Corp., Chicago.
- Cellufoam-Duct Insulation. Masonite Corporation, Chicago.
- Cementico Concrete Waterproofing Paint, United States Gypsum Co., Chicago.
- Cementseal—Enamels & Paint. Acorn Refining Co., Cleveland,
- Cementite-Paint. Thompson & Co., Pittsburgh, Pa.
- Cementkote—Paint. Tropical Paint & Oil Co., Cleveland, O.

- Cempro-Concrete Paint. Asphalt Products Co., Syracuse, N. Y.
- Centripeller Ventilating Fans. Paul R. Jordan & Co., Inc., Indianapolis.
- Certified—Conditioning Units, Furnaces, Heaters. Stainless & Steel Products Co., Saint Paul, Minn.
- Challenger Domestic Stokers. Link Belt Co., Chicago.
- Challenger-Stokers. Kol-Master Corp., Oregon, Ill.
- Chamberlin Automatic Humidifier. Chandler Co., Cedar Rapids, Ia.
- Champion Furnaces. Wheeling Furnace Corp., Martins Ferry, Ohio.
- Charavay Fans. Hartzell Propeller Fan Co., Piqua, O.
- Checker Cont Sheets. Continental Steel Corp., Kokomo, Ind.
- Chicago—Brakes and Presses. Dreis & Krump Mfg. Co., Chicago, Ill.
- Chicago-Wrigley—Toggle and Anchor bolts, Chicago Expansion Bolt Co., Chicago.
- Chicastic Castable—Refractory. Chicago Fire Brick Co., Chicago, Ill.
- Chico Brikset High Temperature Cement, Chicago Fire Brick Co., Chicago, Ill.
- Chief-Furnaces. Joliet Heating Corp., Joliet. Ill.
- Chieftain Refrigerating Compressors.
 Tecumseh Products Co., Tecumseh,
- Chinook—Heating Coils. Bayley Blower Co., Milwaukee, Wis.
- Chinookin Heating Coils. Bayley Blower Co., Milwaukee, Wis.
- Chromang-Electrodes. Arcos Corporation, Philadelphia.
- Chromend—Electrodes. Arcos Corporation, Philadelphia.
- Chromeweld-Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Chromium 173 Silver—Aluminum Paint. C. H. Dragert Company, Inc., Brook-
- Chromlead Enamels and Lacquers. Dragert Co., C. H., Inc., Brooklyn.
- Chronat—Furnace and Boiler Repairs.
 National Fdry. & Furnace Co., Dayton. O.
- Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Chrysler-Airtemp Heating and Cooling Equipment. Airtemp Div., Chrysler Corp., Dayton, Ohio.
- Cibulas—Puttyless Skylights. General Sheet Metal Works, Inc., Bridgeport, Conn.
- Cinch—Expansion Bolts. National Lead Co., New York City.
- Circle T-Switches. Trumbull Electric Mfg. Co., Plainville, Conn.
- Circo-Louvers & Shutters. Circulators & Devices Mfg. Corp., New York City.
- CirCOOLator Fans and Ventilators. Viking Air Conditioning Corporation, Cleveland, O.
- Circulaire Heaters. J. V. Patten Co., Sycamore, Ill.
- Clason—Snow Guards. M. N. Cartier & Sons Company, Providence, R. I.
- Class 60-Fuel Oil Pumps. Kraissl Company, Inc., Hackensack, N. J.

- Classic—Heating & Ventilating Registers. Auer Register Co., Cleveland, O.
- Clean-Aire—A. C. Furnaces. Harvey-Whipple, Inc., Springfield, Mass.
- Cleanaire Blower-Filters. Peerless Foundry Co., Indianapolis, Ind.
- Cleveland Furnaces, Dornback Furnace & Fdy. Co., Cleveland.
- Climate Changer Air Conditioning Units. Trane Co., La Crosse, Wis.
- Climate Master—Oil Burning Air Conditioning Furnace. Hess Warming & Ventilating Co., Chicago, Ill.
- Climator—Blower-Filter Units, L. J. Mueller Furnace Co., Milwaukee.
- Clincher—Conductor Fittings and Accessories. Milcor Steel Co., Milwau-
- Cog-Belts-V-type Belts. Dayton Rubber Mfg. Co., Dayton, Ohio.
- Colalloy-Light Weight Shapes, Plates. Colonial Alloys Co., Philadelphia.
- Coldstream Air Conditioning Units.

 Baker Ice Machine Company, Inc.,
- Collopakes Roofing Paint. Samuel Cabot, Inc., Boston.
- Colonial Blower-Filters, Oil Burners, Furnaces, Humidifiers, Heaters, Stokers, Green Colonial Furnace Co., Des Moines Ia.
- Colonial Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn.
- Colonial—Gravity Registers. Auer Register Co., Cleveland, O.
- Colortipt—Arc Welding Electrodes. Wilson Welder & Metals Co., Inc., New York City.
- Columbia-Ventilators. E. E. Souther Iron Co., St. Louis.
- Columbus—Humidifiers. Fred D. Pfening Co., Columbus, Ohio.
- Columbus-Ventilators. F. O. Schoedinger, Columbus, O.
- Combustioneer Stokers. Steel Products Engineering Co., Springfield, O.
- Comet Exhaustair—Fans and Ventilators. New York Blower Co., Chicago, Ill.
- Comfort Furnaces. May Fiebeger Company, Newark, Ohio.
- Comfort Air Humidifiers. Comfort Products Corporation, Harvey, Ill.
- Comfortaire—Stokers. Hamilton Automatic Stoker Corp., Hamilton, O.
- Comfortmaker—Furnaces. Joliet Heating Corp., Joliet, Ill.
- Comfortrol—Blowers and Blower Units, Furnaces. Waterman-Waterbury Co., Minneapolis.
- Comfortrol Effective Temperature Control. Friez Instrument Div., Towson, Md.
- Comfortzone-Furnaces. Michigan Tank & Furnace Corp., Detroit.
- Commander—Furnaces. Peerless Foundry Co., Indianapolis, Ind.
- Co-Min-Co-Insulating Cement. United States Mineral Wool Co., Chicago.
- Compact—Blowers. Bishop & Babcock Mfg. Co., Cleveland, O.
- Compact Oil Burners. The Aldrich Co., Wyoming, Ill.
- Compactaire Air Conditioning Furnaces. Glasby Mfg. Co., Inc., J. P., Bloomfield, N. J.

Condor—Belts. Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J.

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Coni-Vane - Ventilators. Allen Corp., Detroit.

Conservoil-Oil Burners. Crane Company, Chicago.

Consiste-Weld — Welding Compound. Turco Products, Inc., Los Angeles.

Conterflow—Air Conditioning Furnaces. Western Blower Co., Seattle.

Continental-Stokers. Eddy Stoker Co., Chicago.

Control-O-Gas—Valves. Payne Furnace & Supply Co., Beverly Hills, Cal.

Controlaire—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.

Convector — Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago.

Convert-Gas Burners. Columbia Burner Company, Toledo, Ohio.

Coolair—Fans and Ventilators. American Coolair Corp., Jacksonville, Fla.

Coolite—Heat Absorbing Glass. Mississippi Glass Company, New York City.

Copperkote — Waterproofing. Cheney Metal Products Company, Trenton, N. I.

Copperior — Sheets. Superior Sheet Steel Co., Canton, O.

Copperskin—Waterproof sheathing paper. Angier Corp., Framingham, Mass.

Cop-R-Loy — Copper Bearing Steel Sheets. Wheeling Corrugating Co., and Wheeling Steel Corp., Wheeling, W. Va.

Copruf-Roofing, Copper Roofs Corporation, Milwaukee.

Copruf Valley - Flashings. Copper Roofs Corporation, Milwaukee.

Corinco — Insulation. Cork Insulation Co., Inc., New York, N. Y.

Corkboard—Insulation. Armstrong Cork Co., Lancaster, Pa.

Corona Dust Separator and Collector. Clark Dust Control Company, Chicago.

Cottrell - Dust Collectors. Research Corporation, New York City.

Crane Basmor — Bastian-Morley Co., Inc., LaPorte, Ind.

Crescent — Furnaces. Green Colonial Furnace Co., Des Moines, Ia.

Crescent-Oil Burners. Caloroil Burner Corp., Hartford, Conn.

Crescent — Furnaces. Crane Company, Chicago.

Chicago.

Crescent—Skylights, Ventilators. American Sheet Metal Works, New Or-

Crestoloy — Tools. Crescent Tool Co., Jamestown, N. Y.

Crucibleweld—Arc Welding Electrodes. Westinghouse Electric & Mfg. Co., East Pittsburgh.

Crusader — Oil Burners. Bethlehem Fdry. & Mach. Co., Bethlehem, Pa.

Crystal—Crackle Finish Paint. Hilo-Varnish Corp., Brooklyn.

Custom-Aire — Furnaces and Heaters. Heating Equipment Co., San Francisco.

Cyclops—Bearings. Roller Bearing Co. of America, Trenton, N. J.

D

D&E—Vacuum Furnace Cleaners, Stokers. Dickson Coal Co., New York City.

DL—Controls, Filters, Relays, Switches, Thermostats, Transformers and Solenoid Valves. Detroit Lubricator Co., Detroit

D-Q-Furnace Vacuum Cleaners. Densmore-Quinlan Co., Kenosha, Wis.

Dakota-Oil Burners. Fargo Foundry Co., Fargo, N. D.

Da-Nite — Acratherm. Minneapolis-Honeywell Reg. Co., Minneapolis.

Daptoblu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis.

Dasco-Punches, Tools. Damascus Steel Products Corporation, Rockford, Ill.

Deco-Metal Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati.

Defender—Oil Burners. Silent Glow Oil Burner Corp., Hartford, Conn.

Deflecto — Ventilators. The Day Co., Minneapolis, Minn.

Deflectrol—Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.

Degrace — Enamels, Lacquers and Paints, Detroit Graphite Co., Detroit.

Dehydrantine — Waterproofing. A. C. Horn Co., Long Island City.

Delco-Heat — Oil Burners, Furnaces, Motors, Pumps and Stokers. Delco Appliance Div., General Motors Corp., Rochester, N. Y.

DeLuxe — Air Conditioning Furnaces. Williamson Heater Co., Cincinnati.

DeLuxe—Gravity Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

DeLuxe — Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Dena-Pae — Asbestos Cement. Norristown Magnesia & Asbestos Co., Norristown, Pa.

Deexidine — Metal Protecting Paint. American Chemical Paint Co., Ambler. Pa.

Dependable—Paint. Heath & Milligan Mfg. Co., Chicago, Ill.

Dereka-Paint. Debevoise Co., Brooklyn, N. Y.

De-Sta-Co — Blower Housings and Stampings. Detroit Stamping Co., Detroit.

Detroit LoStoker — Stokers. Detroit Stoker Co., Detroit.

Detroit RotoStoker-Overfeed Spreader Stoker. Detroit Stoker Co., Detroit.

Detroit UniStoker - Stokers. Detroit Stoker Co., Detroit.

Dew-Aire — Air Conditioning Units.
Standard Computing Scale Co., Detroit.

Dexter Heat Valve—Ridge Ventilators Swartwout Co., Cleveland.

Dial-Set — Stokers. Kol-Master Corp., Oregon, Ill.

Diamond — Compounds, Enamels, Lacquers and Paint. Thompson & Co., Pittsburgh, Pa.

Diamond—Smoke Pipe Dampers. Adams Company, The, Dubuque, Ia.

Diamond H — Controls, Relays, Switches. Hart Mfg. Co., Hartford, Conn. Di-Areo - Precision Machines. O'Neil-Irwin Mfg. Co., Minneapolis.

Dickinson—Ventilators. Aeolus Dickinson, Chicago, Ill.

Dickrope—V-type Belts. R. & J. Dick Co., Passaic, N. J.

Dike—Furnace Cement. George B. Klee Co., Cincinnati, O.

Di-Mol—Hack Saws. Henry Disston & Sons, Inc., Philadelphia.

Directaire—Air Conditioning Furnaces. Fitzgibbons Boiler Co., Inc., New York City.

Directherm—Furnaces. Airtherm Mfg.

Dixigas—Gas Welding Rod. Atlantic Steel Co., Atlanta, Ga.

DixiPeer-Electrodes. Atlantic Steel Co., Atlanta. Ga.

Dixisteel—Angles, Bars, Channels, Rivets, Wire. Atlantic Steel Co., Atlanta Co.

De-All — Combination Hammer and Drill. Wodack Electric Tool Corp.,

Donli-Buffers, Grinders, Polishers & Sanders. Continental Machines In-

corporated, Minneapolis.

Doall Metalmaster — Contour cutting saw. Continental Machines Incorpo-

rated, Minneapolis.

Doall 100-Ton Hydraulie—Press. Con-

tinental Machines, Inc., Minneapolis.

Dorwil—Utility Room Furnaces. Gibraltar Engineering Co., Los Angeles.

Double Diamond — Humidistats. Psychrometers, Relays, Switches, Thermometers. H-B Instrument Company, Philadelphia, Pa.

Double-Duty-Oil Burners. Aldrich Co., Wyoming, Ill.

Double-Lock — Roofing. Copper Roofs Corporation, Milwaukee.

Double-Seal-Humidifler Fittings. Hays Mfg. Co., Erie, Pa.

Dover-Imperial-Eaves Trough Hangers. Ohio Wire Products Co., Dover, Ohio,

DovRloy-Sheets. Reeves Steel & Mfg. Co., Dover, Ohio.

Dowmetal - Plates and Sheets. Dow Chemical Co., Midland, Mich.

Draftmaster—Draft Regulators. Campbell Engineering Co., Appleton, Wis.

Draftmaster — Regulators. Platt Products Corp., Lansing, Mich.

Draftender — Motors and Regulators. Penn Electric Switch Co., Goshen, Ind.

Draft-O-Stat — Draft Regulators and Smoke Pipe Dampers. Hotstream Heater Company, Cleveland.

Draftrite-Draft Gages. Bacharach Industrial Instrument Co., Pittsburgh.

Dreadnaught — Soldering Torches and Furnaces. P. Wall Mfg. Supply Co., N. S. Pittsburgh,

Drifilter-Filters. American Air Filter Co., Inc., Louisville, Ky.

Dri-Lap-Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

Dri-N-Tite—Cement. A. C. Horn Co., Long Island City, N. Y.

Driwal—Waterproofing Compound. The Glidden Co., Cleveland.

- Dual-Clone—Blow Pipe Collectors. Day Co., Minneapolis.
- Dubestos—Prefabricated Ducts. Dutton Asbestos & Supply Co., San Francisco.
- Dubblseal Sheeting. Masonite Corp., Chicago.
- Duce—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.
- Ducon Controls, Soldering Coppers.

 Dual Remote Control Co., Wayne,

 Mich.
- Duct Soundliner Duct Insulation. Baldwin-Hill Company, Trenton, N. J.
- Ducturns-Vanes. Tuttle & Bailey, Inc., New Britain, Conn.
- Ductype Blowers. South Bend Air Products, Inc., South Bend, Ind.
- Dukrome Metal Protecting Paint. du-Pont de Nemours & Co., Wilmington, Del.
- Dulux—Enamels, Lacquers and Paints. E. I. du Pont de Nemours & Co., Wilmington, Del.
- Dunco-Relays, Switches, Thermostats. Struthers Dunn, Inc., Philadelphia.
- Duplex—Flashings. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
- Dura-Furnaces, Heaters. Barry Furnace Co., Hamilton, O.
- Dur-A-Ble—Furnaces. St. Louis Furnace Mfg. Co., St. Louis.
- DuraBilt Gravity Registers. Auer Register Co., Cleveland, Ohio.
- Dura-Flex Directional Flow Registers. Auer Register Co., Cleveland.
- Dura-Line—Heating & Ventilating Registers. Auer Register Co., Cleveland.
- Dura-Steel—Registers. Middleton Mfg. & Sales Co., Minneapolis.
- Duratite—Glazing Compounds, Tropical Paint & Oil Co., Cleveland.
- Durex—Bearings. General Motors Corp.,
- Moraine Products Div., Dayton, Ohio.

 Durimet—Acid Resisting Sheets. Duriron Co., Dayton, O.
- Duro-Gloss Stainless Sheets. Jessop Steel Co., Washington, Pa.
- Duronze-Plates and Sheets. Bridgeport Brass Co., Bridgeport, Conn.
- Duroplastic—Caulking & Glazing Compounds. Acorn Refining Co., Cleveland.
- DustStop Filters. Owens-Corning Fiberglas Corp., Toledo, Ohio.
- Dutch Boy-Paint and Solder. National Lead Co., New York City.
- Dux-Sulation Duct Insulation. Grant Wilson, Inc., Chicago, Ill.
- Dynaflow Blowers. South Bend Air Products, Inc., South Bend, Ind.

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- "EX"—Fans. Bayley Blower Co., Milwaukee, Wis.
- E-Z Arc—Arc Welders. Will-Weld Mfg. Co., Omaha, Nebr.
- Eagle Deluxe-Motors. Small Motors, Inc., Chicago, Ill.
- Eagle Mineral Wool-Insulation. Eagle-Picher Lead Co., Cincinnati, O.
- Eagle Star-Solder. Eagle-Picher Lead Co., Cincinnati.
- Eagle Super—Insulating Cement and Flashing. Eagle-Picher Lead Co., Cincinnati, O.

- Eagle Super "66"—Furnace Insulation. Eagle-Picher Lead Co., Cincinnati, O.
- Eagle Supertemp Duct Insulation. Eagle-Picher Lead Co., Cincinnati, O.
- Eagle Tin-Loy Tinning Compounds. Eagle-Picher Lead Co., Cincinnati, O.
- Earle Ventilators. Berger Bros. Co., Philadelphia, Pa.
- East Wind-Window Fans. American Metal Products Co., Fort Worth, Tex.
- Easternoil—Oil Burners. Eastern Oil Equipment Co., Portland, Me.
- Easy-Buffers, Grinders, Polishers and Sanders. Detroit Surfacing Machine Co., Detroit.
- Easy Bead—Eaves Trough and Gutters. St. Paul Corrugating Co., St. Paul, Minn.
- Easy-Flo-Solder. Handy & Harman, New York, N. Y.
- Easy-Slip Conductor Pipe, Eaves Trough and Gutters. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Easyweld—Electrodes. Universal Power Corporation, Cleveland, O.
- Echo-Ceiling Ventilators. Elgo Shutter & Mfg. Co., Detroit, Mich.
- Econocol—Stokers. Cotta Transmission Corp., Rockford, Ill.
- Economizer Nozzles. Bahnson Co., Winston-Salem, N. C.
- Economy Power Hack Saws. F. L. Robertson, Buffalo, N. Y.
- Economy-Furnaces, Heaters. International Heater Co., Utica, N. Y.
- Economy Adjustable Buffing Hoods. Kirk & Blum Mfg. Co., Cincinnati, O.
- Economy—Gravity Registers. Auer Register Co., Clevéland, O.
- Economy-Ventilators. Arex Company, Chicago, Ill.
- Econe-Therm Registers, Middleton Mfg. & Sales Co., Minneapolis, Minn.
- Edge Seal—Filters. Wilson & Co., Inc., Chicago, Ill.
- Edgers Hand Flanging Machines.
 Packham Crimper Co., Mechanics-burg, O.
- Effice—Louvres, Skylights, Ventilators. W. F. Hirschman Co., Inc., Buffalo,
- 80-FWA-Utility Room Furnace. Fitzgibbons Boiler Co., Inc., New York,
- Elasticon—Roofing Paint. A. C. Horn Co., Long Island City, L. I., N. Y.
- Elastikote Paint, Tropical Paint & Oil Co., Cleveland, O.
- El Dryel Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.
- Electric City—Gutter Forming Machines. F. L. Robertson, Buffalo, N. Y.
- Electric Filter Watchman—Air Filter Gauge. Herbusch Corp., St. Louis, Mo.
- Electric Furnace—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.
- Electric Furnace Man—Domestic Stoker. General Machine Co., Inc., Emmaus, Pa.
- Electric Janitor—Controls and Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Electrolaire Air Conditioning Furnaces. Electrol Mfg. Co., Passaic, N. J.
- Electro-Matie Filters. American Air Filter Co., Inc., Louisville, Ky.
- Electronic Tornado—Arc Welders. Lincoln Electric Co., Cleveland, O.

- Electropump—Water Circulating Pump. Weil Pump Company, Chicago, Ill.
- Electro-Sheet-Roofing. American Brass Co., Waterbury, Conn.
- Electro Way-Fans. Ward Mfg. Co., Plymouth, Mich.
- Electro-Wind-Ventilators. Allen Corp., Detroit, Mich.
- Elgin—Brazing Torches and Welders. Borm Mfg. Co., Elgin, Ill.
- Elgin Louvers and Shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.
- El Glykol-Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.
- Elite—Gravity Registers. Auer Register Co., Cleveland, O.
- Elturn-Duct Turning Vanes. Barber-Colman Co., Rockford, Ill.
- Emerson, Jr.—Emerson Electric Mfg. Co., St. Louis, Mo.
- Empire—Mallets. Greene, Tweed & Co., Bronx, N. Y.
- Enamel-Kote Enamels. Acme White Lead & Color Works, Detroit, Mich.
- Endurance—Cement and Paint. Glidden Company, Cleveland, O.
- Enduro-Sheets. Republic Steel Corp.,
- Cleveland, O.

 Epce—Perforated Metals. Erdle Perforating Co., Rochester, N. Y.
- Era-Furnaces. Excelsior Steel Fur-
- nace Co., Chicago, Ill.
- Era Exl-Air—Furnaces. Excelsior Steel Furnace Co., Chicago, Ill.

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- Erco Flanging and Shrinking Machines, Power Punches. Engineering and Research Corporation, Riverdale, Md.
- Esco—Smoke Pipe Dampers. Eselgroth & Co., Newark, N. J.
- Esico Electric Soldering Coppers. Electric Soldering Iron Co., Inc., Deep River, Conn.
- Essee—Solder and Roofer Tools. Eastern States Supply Co., Brooklyn. N. Y.
- Esso-Furnaces, Oil Burners. Gilbert & Barker Mfg. Co., West Springfield, Mass.
- Eternium--Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
- Eureka—Furnaces. Home Stove Co., Indianapolis, Ind.
- Evannir—Furnaces and Gas Heaters. Evanoil Div., Evans Products Co., Detroit, Mich.
- Evansway Furnaces. George Evans Corp., Moline, Ill.
- Evco-Valves. Electric Valve Mfg. Co., New York, N. Y.
- Everdur Plates, Sheets, Electrodes, Welding Rod. American Brass Co., Waterbury, Conn.
- Everjet-Roofing Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
- Everwear—Eaves Trough and Gutters with Fittings, Ridge Rolls and Ridging, Roofing, Metal Shingles and Tile, Ventilators, Southern States Iron Roofing Co., Savannah, Ga.
- Excelsior Elbow Knife. C. DeWitt Wagner, Cedar Rapids, Ia.
- Exidust—Dust Collectors. Allen Bill-myre Co., Mamaroneck, N. Y.
- Ex-L-ite—Sheets. Republic Steel Corporation, Cleveland, O.

E-Z-On—Damper Clips and Tips, and Damper Regulators. M. A. Gerett Co., Milwaukee, Wis.

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Exy-Flo — Torch Formula Soldering Paste. L. B. Allen Co., Inc., Chicago,

F & D-Refractories, General Insulating Products Co., Brooklyn, N. Y.

& E-Underfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

F.M.D.—Solder. American Smelting & Refining Co., New York, N. Y.

Fabrikated — Grilles, Registers. Independent Register Co., Cleveland, O.

aceweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Falco-Sheets. Fairmont Aluminum Co., Fairmont, W. Va.

Famous — Furnaces. Excelsior Steel Furnace Co., Chicago.

Famous Exl-Air — Air Conditioning Furnace. Excelsior Steel Furnace Co., Chicago, Ill.

Far-Air—Evaporative Coolers, Filters. Farr Co., Los Angeles, Calif.

Far-Air Rotary — Automatic Filters. Farr Co., Los Angeles, Calif.

arco—Soldering Flux. Farrelloy Com-pany, Inc., Philadelphia, Pa.

-Furnaces. Farquhar Furnace Co., Wilmington, O.

Fastemp—Furnaces. Norge Heating & Cond. Div., Detroit, Mich.

Featherin-Coils. L. J. Wing Mfg. Co., New York, N. Y.

Featherweight—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Featherweight — Thermostat Switch Co., Chicago, Ill. - Thermostats. Magnet

Federal-Refractories. U. S. Stoneware

Co., Akron, O.

F Electrie—Fan Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Felt-Cote - Steel Roofing. American Steel Band Co., Pittsburgh, Pa.

estra — Heat Insulating Windows. etroit Steel Products Co., Detroit,

Fenn's Rotary--Roof Ventilators. Waverly Heating Supply Co., Boston,

- Steel Roofing. Truscon Steel Co., Youngstown, O.

Ferroclad — Building Insulation. Trus-con Steel Co., Youngstown, O.

Ferrocraft — Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Flange & Mfg. Co., Inc., New York, Ferro-Therm .

Ferroweld — Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Fiberglas—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.

Fiberkote—Roof Cement. National Manufacturing Corp., Tonawanda,

Filteraire — Window Ventilator - filter units. Davies Air Filter Corp., New York, N. Y.

iltered Aire—Blower-Filters. American Foundry & Furnace Co., Bloomington, Ill.

Stokers. Bluffton Mfg. Co., Findlay, O.

Fine Air—Air Conditioning Furnaces. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.

Fin-Flex-Directional Flow Registers.
The Auer Register Co., Cleveland, O.

Fin-Line-Directional Flow Registers. The Auer Register Co., Cleveland, O.

Firebox-Combustion Chambers. Harvey, Inc., Valley Stream, N. Y.

Firecrete - Refractories. Johns-Manville, New York, N. Y.

Firedaire — Circulating Heaters. Ed-wards Mfg. Co., Inc., Cincinnati, O.

Fire-Fixer — Firing Tools. Farrell-Cheek Steel Co., Sandusky, O.

Peerless Mfg. -Stokers. Corp., Louisville, Ky.

Firê-Hearth — Castable Refractories. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Fireite—Cement. Johns-Manville, New York, N. Y.

Fire-King-Stokers. Sinker-Davis Co., Indianapolis, Ind.

Fireline—Furnace Firepot Lining. Fireline Stove & Furnace Lining Co., Chicago 14, Ill.

ire Pilot — Stoker Control. Sampsel Time Control, Inc., Spring Valley, Ill.

-Stokers. Holcomb & Hoke Mfg. Co., Indianapolis, Ind.

Firma-Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Pitrite—Conductor, Eaves Trough and Gutter Fittings and Accessories, Skylight Lifts, Snow Guards, Venti-lators. David Levow, or Rival Strap Corp., New York, N. Y.

Fitzgibbonsaire—Air Conditioning Unit. Fitzgibbons Boiler Co., New York, N. Y.

Fixit — Cement. National Mfg. Corp., Tonawanda, N. Y.

Flash-Off No. 99 — Industrial Finish. Acme White Lead & Color Works, Detroit, Mich.

lash-Rite - Flashings. The Figge Mfg. Co., Chicago, Ill. Flash-Rite -

Flatjet—Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Flat-Top-Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.

Fleetweld - Arc Welding Electrodes Lincoln Electric Co., Cleveland, O.

Fleur de Lis-Conductor Heads and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Flexaire—Registers and Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Flexare—Arc Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Flex-Bar — Registers. United States Register Co., Battle Creek, Mich.

"Flexiblae"-Paint. Samuel Cabot, Inc., Boston, Mass.

er Mfg. Co., Chicago, Ill. Flex-Tube-Draft Gauges.

-Co - Furnaces. Floral City Co., Monroe, Mich.

loesy—Solder. Merchant & Evans Co., Philadelphia, Pa.

Flor-Aire—Floor Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.

Flosel-Flux. American Chemical Paint

Co., Ambler, Pa.

Flotrol — Valves. Monmouth Products Co., Cleveland, O.

Flo-Warm—Coal, Oil, Gas and Stoker-Fired Furnaces. Williamson Heater Co., Cincinnati, O.

Flualyzer — Portable Co₂ Analyzer. Chas. Engelhard, Inc., Newark, N. J.

Fluemaster—Chimney Furnace. Round Oak Co., Dowagiac, Mich.

Fluid Heat — Oil Burners, Furnaces, Water Heaters. Anchor Post Fence Co., Baltimore, Md.

Foamglas-Insulation. Armstrong Cork Co., Lancaster, Pa

Foliansbee-Furnace Pipe. Sheet Metal Specialty Co., Pittsburgh, Pa.

Forbes Syphonaire-Ventilators. Western Engineering & Mfg. Co., Los Angeles. Calif.

Force-Flo-Water Circulating Pumps. Kehm Corp., Chicago.

Ford-V-Neer — Building Insulation. Ford Roofing Products Co., Chicago,

Forest Fleece—Insulation. John J. Do-heny Co., Belmont, Mass.

Forstair—Circulating Heaters. Pernot & Rich, Inc., Los Angeles, Calif.

-Skylights. F. O. Schoedinger, Columbus, O.

ndation Coating - Waterproofing. Glidden Co., Cleveland, O.

Four-Way-Flow-Registers. United States Register Co., Battle Creek,

Fracto-Crete—Castable Refractory. Ramtite Co., Chicago.

Fransite-Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

ree-Aire — Furnaces and Circulating Heaters. Kehm Corporation, Chicago,

reeman—Stokers. Illinois Iron & Bolt Co., Chicago, Ill.

Freeport-Oil Burners. Holtum Mfg. Co., Freeport, Ill.

Friction Fighter-Bearings. Link-Belt Co., Chicago, Ill.

Frigid—Night Air Cooling and Exhaust Fans and Fan Blades. Circulators & Devices Mfg. Corp., New York, N. Y.

Front End-Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

-Air Conditioning Units. Fros-T-aire - Air Conditioning Units. Palmers Manufacturing Corp., Phoenix, Ariz.

Frost-O-Lite-Paint. Sanvin Chemical Products Co., Moline, Ill.

Fuel-Saver—Automatic Draft Regula-tor. Walker Mfg. & Sales Corp., St. Joseph, Mo.

Fulljet-Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Fulscope—Controls. Taylor Instrument Companies, Rochester, N. Y.

Fulton-Copper Paint. Debevoise Co., Brooklyn, N. Y.

Fulton-Register Shield. Patent Novel-ty Co., Fulton, Ill.

Fyre-Chek-Draft Regulators. Wisconsin Heating & Draft Control Co., Appleton, Wis.

Fyre-Mortar-Insulating Cement Quig-ley Company, Inc., New York, N. Y.

Fyr-feeder—Stokers. American Coal Burner Company, Chicago, Ill.

Fyrgard-Doors. Richmond Fireproof Door Co., Richmond, Ind.

- Fyrite—CO₂ Analizers. Bacharach Industrial Instrument Co., Pittsburgh.
- Fyr-Fly-Oil Burners. The Aldrich Co., Wyoming, Ill.

G

- G. B. C.—Blowers and Fans. General Blower Co., Philadelphia, Pa.
- G/C Controls. General Controls Co., Glendale, Calif.
- G-E-Air Conditioning Units, Oil Burners, Compressors, Controls, Soldering Coppers, Couplings, Electrodes, Fans, Flux, Furnaces, Humidistats, Motors, Relays, Switches, Transformers, Solenoid Valves, Thermostats, Welders. General Electric Co., Bloomfield, N. J., and Schenectady, N. Y.
- G-M-Grilles, Louvres, Shutters, Registers, Metal Stampings, Ventilators. Gillian Mfg. Co., Detroit, Mich.
- G. R.—Air Conditioning Units. Window Ventilators and Filter Units. General Refrigeration Div. Yates-American Machine Co., Beloit, Wis.
- Galvanide—Metal Protecting Paint. A C. Horn Co., Long Island City, N. Y.
- Galvaprep—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.
- Garland Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit, Mich.
- Gas-Era—Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.
- Gas King-Furnaces. J. King Kent & Co., St. Louis, Mo.
- Gas Mizer-Furnaces. Floral City Co., Monroe, Mich.
- Gastite—Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.
- Gas-Vac—Furnaces and Heaters. Vacuum Gas Appliance Div., Union Fork & Hoe Co.. Rome, N. Y.
- Gasweld—Soldering Coppers, Torches, and Welding Equipment. Wall Chemicals Div., Liquid Carbonic Corp., Chicago.
- Gem-Furnaces. Robinson Furnace Co., Chicago, Ill.
- Gem-Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.
- Gemaco Compressors. General Machinery Co., Spokane, Wash.
- Gemware Hygrometers, Psychrometers, Thermometers, G. M. Mfg. Co., New York, N. Y.
- Gen-Are—Arc Welders. General Equipment Co., Wichita, Kan.
- Genasco Cement, Compounds, Paint. Barber Asphalt Corp., Barber, N. J.
- General Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
- General Aire Fans. General Aire Company, Philadelphia, Pa.
- Generator—Coils. Hotstream Heater Co., Cleveland, O.
- Gerotor-Fuel Oil Pump, May Oil Burner Corporation, Baltimore, Md.
- Giant-Oil Burners. Aldrich Co., Wyoming, Ill.
- Gibraitar—Furnace and Heaters. P. H. MaGirl Foundry & Furnace Works, Bloomington, Ill.
- Gilbarco Blower-Filter Units, Furnaces, Oil Burners and Draft Regulators. Gilbert & Barker Mfg. Co., West Springfield, Mass.
- Gileo-Furnaces and Water Heaters. J. L. Gillen Co., Dowagiac, Mich.
- Gilcoal—Stokers. Catskill Metal Works, Inc., Catskill, N. Y.

- Gilt Edge-Furnaces. Schwab Furnace Co., Milwaukee, Wis.
- Glazola Glazing Compounds. Nebel Mfg. Co., Cleveland, O.
- Globe-Sheets. Newport Rolling Mill Co., Newport, Ky.
- Globe-Ventilators. J. M. & L. A. Osborn Co., Cleveland, O.
- Globe Sizzler—Hot Water Coils. Globe Machinery & Supply Co., Des Moines,
- Glo-Fyr-Oil Burners. Aldrich Co., Wyoming, Ill.
- Glowan—Gas Burners. J. O. & C. U. Martin, San Francisco, Calif.
- Gnome-Oil Burners. Aldrich Co., Wyoming, Ill.
- Gohi-Eaves Trough & Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
- Gohi Sheets. Newport Rolling Mill Co., Newport, Ky.
- Gold Bond-Insulation Board, Tile. National Gypsum Co., Buffalo, N. Y.
- Gold Bond-Gimeo Rock Wool Products, Insulating Cement. National Gypsum Co., Buffalo, N. Y.
- Golden Rod Air Conditioning Units, Fans and Wheels, Blowers. F. Jaden Mfg. Co., Inc., Hastings, Nebr.
- Gordon—Gas Conversion Burners. Roberts-Gordon Appliance Corp., Buffa-
- Gradutrol Controls. Minneapolis-Honeywell Regulator Co., Minneapolis. Minn.
- Grand Rapids—Vacuum Furnace Cleaner. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
- Graylite Building and Duct Insulation, Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.
- Greastop Filters. Air-Maze Corporation, Cleveland, O.
- Grid—Heating and Cooling Coils. D. J. Murray Mfg. Co., Wausau, Wis.
- Grillometer Direct Reading Air Velocity Meter. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.
- Gross-Aire—Furnaces and Stokers. Grossenbacher Furnace Co., St. Louis, Mo.
- Gurney Furnaces. East Anaheim Sheet Metal Works, Long Beach, Calif
- Guthfan-Ventilating Fans. Edwin F. Guth Company, St. Louis.

H

- H-B-Gas Conversion Burner. Handley Brown Heater Co., Jackson, Mich.
- H&C-Registers. Hart & Cooley Mfg. Co., Holland, Mich.
- H & K-Perforated Metals. Harrington & King Perforating Co., Chicago, Ill.
- HairBestos—Insulation. Wilson & Co., Inc., Chicago, Ill.
- Haircraft-Insulation. Wilson & Co., Inc., Chicago, Ill.
- Hair Glass-Filters. H. J. Somers, Inc., Detroit, Mich.
- Hammerkraft-Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
- Hammer-Sets—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.
- Handnib-Punches. National Machine Tool Co., Racine, Wis.

- Handy—Pipe, Prefabricated Ducts and Fittings. F. Meyer & Bro. Co., Peoria, Ill.
- Handy-Andy-Clinker Tong. Northwestern Stove Repair Co., Chicago,
- Handy Change—Arc Welders. Maple Valley Mfg. Co., Mapleton, Iowa.
- Handy-Flux-Soldering Flux. Handy & Harman, New York, N. Y.
- Happy Thought Heaters. Pittston Stove Co., Pittston, Pa.
- Hardweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Health-Air Window Ventilator-Filters. Reliable Sheet Metal Engineering Co., Chicago, Ill.
- Health-aire—Blower, Coils, Fans, Louvers and Shutters and Ventilators.
 Johnson Fan & Blower Corp., Chicago, Ill.
- Hearth—Refractories. Refractory & Insulation Corporation, New York,
- Heat-Aid—Furnace Linings. Pyrolite Products Co., Cleveland, Ohio.
- Heat Booster—Warm Air Booster Fans. Victor Electric Products, Inc., Cincinnati, Ohio.
- Heat Breaker Fans. Warren Earl Company, Houston, Tex.
- Heat Check-Insulating Cement. Refractory & Insulation Corp., New York City.
- Heat Holder—Baffles. Sid Harvey, Inc., Valley Stream, N. Y.
- Hent Hustler—Booster Fans. American Foundry & Furnace Co., Bloomington, Ill.
- Heatmaker—Circulating Heater. Iron Fireman Mfg. Co., Cleveland, O.
- Heat-Pak-Oil Burners. Aldrich Co., Wyoming, Ill.
- Heat Proof-Paint. Glidden Co., Cleveland, O.
- Hent-Rite—Gravity Registers. Auer Register Co., Cleveland, O.
- Heatrola-Heaters. Estate Stove Co., Hamilton, O.
- Heatseal-Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Heavyduty—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.
- Heet-Master Kettles. Aeroil Burner Co., Inc., West New York, N. J.
- Hellite Refractories. Johns-Manville. New York, N. Y.
- Helyx—Drive Screws. Hillwood Manufacturing Co., Cleveland, O.

 Herco—Welders. Hercules Electric &
- Mfg. Co., Inc., Brooklyn, N. Y.

 Hercules—Fan Roof Ventilators. W. F.

 Hirschman Co., Inc., Buffalo, N. Y.
- Hirschman Co., Inc., Buffalo, N. Y. Hercules—Furnaces. Johnston Gas Fur-
- nace Corp., North Hollywood, Calif.

 Hereules—Gravity Roof Ventilators.
- Berger Bros. Co., Philadelphia, Pa. Heresite—Pipe and Fittings. Heremetal Co., Minneapolis, Minn.
- Co., Minneapolis, Minn.

 Hermetie—Furnaces. Favorite Mfg. Co.,
- Piqua, Ohio.

 Hero—Heaters, J. V. Patten Co., Syca-
- Hev-E-011 Oil Burners. Sanmyer Corp, Chicago, Ill.

more, Ill.

Hevikont—Electrodes. Universal Power Corporation, Cleveland, Ohio. Hexagonal Mesh-Wire Glass. Mississippi Glass Co., New York, N. Y.

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Hi-Boy — Furnaces. Aladdin Heating Corp., Oakland, Calif.

HiBoy-Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

Hicycle—Electric Tools. Chicago Pneumatic Tool Co., New York, N. Y.

Highflex—Belts. B. F. Goodrich Co., Akron, O.

High-Ten- No. 500—Solder. Industrial Service Laboratories, Milwaukee, Wis.

Highway—Copper Iron, Apollo Steel Co., Apollo, Pa.

Hi-Gloss — Stainless Sheets. Jessop Steel Co., Washington, Pa.

Hi Heat — Enamels and Lacquers, Aluminum Paint. J. H. Krehbiel Co., Chicago, Ill.

Hi-Heat Gray-Paint. Wailes Dove-Hermiston Corporation, Westfield, N. J.

HI-Lo-Variable Speed Pulleys. Equipment Engineering Co., Minneapolis, Minn.

Hilo Spatter—Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.

Hilume - Aluminum Paint. Hilo Varnish Corp., Brooklyn, N. Y.

Hinman—Angle Benders. L. R. Evans Machine Co., Sandwich, Ill.

Hi-Speed—Nibbler and Shears. Libert Machine Co., Green Bay, Wis.

Hi-Spra — Spray Nozzles. Schubert-Christy Corp., Indio, Calif.

Hi-Temp-Insulating Cement. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Hi-Test-Safety Glass. Libbey-Owens-Ford Glass Co., Toledo, Ohio.

Hitoneast — Grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Hoffman — Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

Hold Heat—Soldering Coppers. Turner Brass Works, Sycamore, Ill.

Holgun—Portable Electric Drills. Black & Decker Mfg. Co., Towson, Md.

Holtite — Screws. Continental Screw Co., New Bedford, Mass.

Home—Furnaces. Rock Island Stove Co., Rock Island, Ill.

Home Comfort-Blowers, Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Horneblende — Metal Protecting Paint. North American Fibre Products Co., Cleveland, Ohio.

Hot Blast —Furnaces and Heaters. Cole Hot Blast Mfg. Co., Chicago, Ill.

Hot Blast — Soldering Furnaces and Torches. Turner Brass Works, Sycamore, Ill.

Hotco-Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.

Hot Spot — Electric Welders, Acme Electric Welder Co., Los Angeles,

Hot Wave—Coils. Rudy Furnace Co., Dowagiac, Mich.

Howle — Heat Savers. Condensation Engineering Corp., Chicago, Ill.

Hoyt-Lead Roofing. National Lead Co., New York, N. Y.

Huber-Overfeed Stokers. Flynn & Emrich Co., Baltimore, Md. Humidair—Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.

Humidair—Washers. American Foundry & Furnace Co., Bloomington, Ill.

Humidigrad-Valves. Monmouth Products Co., Cleveland, O.

Humidigraph — Hygrometers. Bristol Company, Waterbury, Conn.

Humidiguide—Hygrometer, Taylor Instrument Companies, Rochester, N. Y.

Humidostat — Humidistats. Johnson Service Co., Milwaukee, Wis.

Humiduct—Humidifiers. Bahnson Co., Winston-Salem, N. C.

Humphrey — Furnaces and Heaters. General Gas Light Co., Kalamazoo, Mich.

Hyearb—Electrodes. Universal Power Corporation, Cleveland, O.

Hydra — Valves. Albright Equipment Co., Johnstown, Pa.

Hydraulic-Action — Controls. White-Rodgers Electric Co., St. Louis, Mo.

Hydrocide—Compounds, Paint, Waterproofing. L. Sonneborn Sons, Inc., New York, N. Y.

Hydro - Clone — Blowpipe Collectors and Fume Exhausters. Whiting Corporation, Harvey, Ill.

Hydronon — Concrete Waterproofing Paint. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Hydro-Proof — Water-Proofing Compounds. Asphalt Products Co., Syracuse, N. Y.

Hydro-Whirl-Dust Collectors. Peters-Dalton, Inc., Detroit, Mich.

Hy-Duty—Blades, Fans, Blowers, Housings, Pumps, Ventilators, Wheels. Schwitzer-Cummins Co., Indianapolis, Ind.

Hy-Power—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Hyspar—Roof Cement Compounds, Paint. Midland Paint & Varnish Co., Cleveland, O.

Hytemp—Insulation. Keasbey & Mattison Company, Ambler, Pa.

Hytempite—Furnace Cement. Quigley Company, Inc., New York, N. Y.

Hytest-Paint. National Mfg. Co., Ton-awanda, N. Y.

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IEC-Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

Ice-O-Matic — Compressors. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Ideal — Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.

Ideal-Roofing Nails. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Ideal (Air Cell)—Insulation. Hinde & Dauch Paper Co., Sandusky, Ohio.

Ilgair — Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Ilgette-Kitchen Exhaust Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Impact—Spray Nozzles. Phillips Cooling Tower Co., Inc., New York, N. Y.

In-Bilt—Kitchen Exhaust Fans. Victor Electric Products, Inc., Cincinnati, O.

Inco-Paint. Inter-Coastal Paint Co., East St. Louis, Ill. Inco-Nickel Alloys and Welding Rod. International Nickel Co., Inc., New York, N. Y.

Inconel—Alloys. International Nickel Company, Inc., New York, N. Y.

Independent — Furnaces. Independence Stove & Furnace Co., Independence, Mo.

Indian—Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.

IngAclad—Plates and Sheets. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago, Ill.

Ingels—Elbow Machines and Punches.
Maplewood Machinery Co., Chicago,
Ill.

Ingle-Oil Burners and Furnaces. National Iron Works, San Diego, Calif.

Inget Iron—Sheets, Ridge Rolls and Ridging. American Rolling Mill Co., Middletown, Ohio.

Inkstop—Filters. Air-Maze Corporation, Cleveland, O.

Insa-Lute—Insulating Cement. Sauereisen Cements Co., Pittsburgh, Pa.

Ins-Lite—Building and Duct Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.

Insola-Metal Protecting Paint. Acorn Refining Co., Cleveland, O.

Insulag—Insulation and Insulating Cement. Quigley Co., Inc., New York, N. Y.

Insulation. Refractory & Insulation Corp., New York, N. Y.

Insulblox-Insulation. Quigley Co., Inc., New York, N. Y.

Insulate-Windows — Heat Insulating Windows. Chamberlin Metal Weather Strip Co., Inc., Detroit, Mich.

Insulbrick — Insulation. Quigley Co., Inc., New York, N. Y.

Insulcrete — Insulation. Quigley Co., Inc., New York, N. Y.

Insulduct-Prefabricated Ducts. Smith-Raymond Co., Columbus, Ga.

Interlock-Pipe. Milcor Steel Co., Milwaukee, Wis.

Interiox—Plastic Tee. Extruded Plastics, Inc., Norwalk, Conn.

Ionaire—Ozone Apparatus. Electroaire Corp., Chicago.

Ironite-Hot Surface Paint. Acorn Refining Co., Cleveland, O.

Ironset — Asbestos Furnace Cement. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Ironside — Paint. Thompson & Co., Pittsurgh, Pa.

Ironton—Gas Burners, Heaters. Continental Stove Corp., Ironton, O.

Irpo-Rust-Proofing. Wolfe-Kote Co., Sheboygan, Wis.

Isl City—Registers. Rock Island Register Co., Rock Island, Ill.

Iso-Tem-Automatic Heat Control. Tem Products Co., Midland, Pa.

Ivanhoe-Heaters. Perfection Stove Co., Inc., Cleveland, O.

L

JFS-Variable Speed Pulleys. Stephens-Adamson Mfg. Co., Aurora, Ill.

J-M-Insulation, Roofing. Johns-Manville, New York, N. Y.

J.M.C.—Oil Burners, Johnson Mfg. Co., Waterloo, Iowa.

- Jack Frost-Insulation. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.
- Janitrol A. C. Units, Gas Burners, Furnaces. Surface Combustion, Toledo, O.
- Jennings-Pumps. Nash Engineering Co., South Norwalk, Conn.
- Jet-Cote—Roof Cement. Acme White Lead & Color Works, Detroit, Mich.
- Jet-Lastic-Roof Cement. Acme White Lead & Color Works, Detroit, Mich.
- Jet-O-Matie—Water Circulating Pumps. Gould Pumps Inc., Seneca Falls, N. Y.
- Jewel Furnaces, Heaters. Detroit-Michigan Stove Co., Detroit, Mich.
- Jiffee Coils. Hotstream Heater Co., Cleveland, O.
- Jiffy Regulator Set. Parker-Kalon Corp., New York, N. Y.
- Julian d'Este Draft, Regulators, Gas Pressure Valves. Reading-Pratt & Cady Div., American Chain & Cable Co., Reading, Pa.
- Jumbo-Oil Burners. The Aldrich Co., Wyoming, Ill.
- June-Aire—Furnaces. American Foundry & Furn. Co., Bloomington, Ill.
- Juniata-Soldering Flux. Geo. W. Diener Mfg. Co., Chicago, Ill.
- Justite-Ducts and Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.
- JusRite L-Bo-Furnace Pipe and Fittings. Corbman Bros., Inc., Philadelphia, Pa.

K

- K-B—Damper Clips, Tips and Regulator Sets. G. L. Kerentoff, Cincinnati, Ohio.
- KCB Sheets. Newport Rolling Mill Co., Newport, Ky.
- KCB—Eaves Trough and Gutters, Pipe, Ridge Rolls and Ridging, Roofing. Globe Iron Roofing & Corrugating Co., Newport, Ky.
- K&M Damper Regulator, Valves. Kieley & Mueller, Inc., North Bergen, N. J.
- K&M—Insulation. Keasbey & Mattison Co., Ambler, Pa.
- K&M Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
- K&M Hy-Temp—Insulation, Keasbey & Mattison Co., Ambler, Pa.
- K&M Simplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
- KO-Oil Burning Water Heaters. Automatic Humidifier Co., Cedar Falls, Iowa.
- K.S.V.—Ventilators. Kernchen Co., Chicago, Ill.
- Kant Krush Roof Strainers, Grand Rapids Wire Products Co., Grand Rapids, Mich.
- Karatex—Insulation. Blocksom & Company, Michigan City, Ind.
- Kast-O-Lite-Refractories. A. P. Green Fire Brick Co., Mexico, Mo.
- Kathabar-A. C. Units. Surface Combustion, Toledo, O.
- Kathode—Electrodes, Lincoln Electric Co., Cleveland, O.
- Kaukit-Caulking Compound. L. Sonneborn Sons Inc., New York, N. Y.

- Kelsey-Bradley Furnaces, Kelsey Heating Co., Inc., Syracuse, N. Y.
- Kemick Paint. American Chemical Paint Co., Ambler, Pa.
- Ken-Flue Gas Analyzers, Anemometers, Baffles, Combustion Chambers, Controls, Humidiflers, Damper Motors, Thermometers and Valves. Barclay Inc., Robert, Chicago, Ill.
- Keystone-Heaters. J. V. Patten Co., Sycamore, Ill.
- Kimsul Insulation. Kimberly Clark Corp., Neenah, Wis.
- Kitchen-aire—Fans. Allen Corp., Detroit, Mich.
- Kleenflo-Filters. Air-Maze Corp., Cleveland, O.
- Klenk's Aviation—Snips. Reiner & Campbell Co., Inc., Elizabeth, N. J.
- Klixon Controls, Switches, Humidistats, Motors, Relays, Switches, Thermostats. Spencer, Thermostat Co., Attleboro. Mass.
- Klondike-Welders. Ralph Fern, Scranton, Pa.
- Knight-Ware Prefabricated Ducts and Fittings. Maurice A. Knight, Akron, O.
- Knock-Out—Arc Welders, Buffers Grinders, Polishers and Sanders. K O. Lee & Son Co., Aberdeen, S. D.
- Kno-Draft High Velocity Air Diffusers, W. B. Connor Eng. Corp., Dorex Div., New York, N. Y.
- Knox-Smoke Pipe. Waterloo Register Co., Waterloo, Ia.
- Kold-Aire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.
- Kelestat Furnace Draft Regulator. P. C. Timm & Son, Lincoln, Neb.
- Kolstoker-Stokers. Anchor Stove & Range Co., New Albany, Ind.
- Konical—Ventilators. Milcor Steel Co., Milwaukee, Wis.
- Konver-To-Kol—Conversion Grates. Albert Lea Foundry, Albert Lea, Minn.
- Kooler-Aire Air Conditioning Units.
 U. S. Air Conditioning Corp., Minneapolis, Minn.
- Koolshade—Sun Reflecting Screens. Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
- Koolstack-Furnaces. Leader Iron Works, Inc., Decatur, Ill.
- Koppax Paint. Koppers Co., Pittsburgh, Pa.
- Kristokrak Enamels and Lacquers. Zapon Division Atlas Powder Co., North Chicago, Ill.
- Krome-Kote—Welding Compound. Wolfe-Kote Co., Sheboygan, Wis.
- Kumfort Cooler—Evaporative Coolers. Utility Fan Corporation, Los Angeles, Calif.
- Kwik-Way Ladder Brackets. Myers Ladder Equipment Co., Madison, Wis.

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- L. A.—Motors. Louis Allis Co., Milwaukee, Wis.
- L-M-Tubing. Lewin-Mathes Co., St. Louis, Mo.
- L & N-Instruments. Leeds & Northrup Co., Philadelphia, Pa.
- LP—Ducts, Fittings, Grilles, Pipe, Registers and Ventilators. Lamneck Products, Inc., Middletown, O.

- L & R Conductor Pipe. Lamb . & Ritchie Co., Cambridge, Mass.
- L-R—Flexible Couplings. Lovejoy Flexile Coupling Co., Chicago, Ill.
- L-U-Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
- Lacquers. Glidden Company, Cleveland, O.
- Lakeside Blowers. Furblo Co., Hermansville, Mich.
- Lancol—Stainless Steel Soldering Flux. F. H. Langsenkamp Co., Indianapolis. Ind.
- Lastik Wampum-Cement Paint. Lastik Products Co., Inc., Pittsburgh, Pa.
- Lawson—Heaters. Continental Stove Corp., Ironton, O.
- Leader Oil Burners and Circulating Heaters. Victor Oil Burner Mfg. Co., Hartford, Conn.
- Lead-Head Nails. W. H. Maze Co.,
- Lead-Seal-Roofing Nails. The Deniston Co., Chicago, Ill.
- Lead-Sealed-Sheets. Continental Steel Corp., Kokomo, Ind.
- Leadtex—Lead-Coated Sheets. Revere Copper and Brass Incorporated, New York, N. Y.
- Lectro-Shear—Portable Electric Shears.
 Black & Decker Mfg. Co., Towson,
 Md., and Van Dorn Electric Tool Co.,
 The, Towson, Md.
- Ledaloyl Sleeve Bearings. Johnson Bronze Co., New Castle, Pa.
- Lehigh—Furnaces, Heaters. Pittston Stove Co., Pittston, Pa.
- Leonard—Circulating Oil Heater. W. R. Ames Co., San Francisco, Calif.
- LeRoy—Fan and Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
- Liberty-Paint. Carter Paint Co., Liberty, Ind.
- Liberty-Ventilators. Penn Ventilating Company, Philadelphia, Pa.
- Lifetime Furnaces. Hart & Crouse Corp., Utica, N. Y.
- Lifetime—Furnace Pipe Fittings & Accessories. Campbell Heating Co., Des Moines, Ia.
- Lightweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Lincoln Heaters. American Foundry & Furnace Co., Bloomington, Ill.
- Lincolnweld—Arc Welders. The Lincoln Electric Co., Cleveland, O.
- Linseal Furnace Cement. Buckeye Products Co., Cincinnati, O.
- Linestart—Motors. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Lipman Coils, Compressors, General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
 Liquid Elastigum—Paint and Roofing
- Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

 Lithoform—Metal Protecting Paint.

 American Chemical Paint Co., Am-
- bler, Pa.

 Little Blacksmith Punches and Slitting Machines. J. F. Kidder Mfg. Co., Inc., Burlington, Vt.
- Little Giant Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
- Llenroe Fire Doors. Cornell Iron Works, Inc., Long Island City, N. Y.

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Lloyd's-Stainless Soldering Flux. Lloyd S. Johnson Co., Chicago, Ill.

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loyd's No. 7 — Silver Solder Flux Lloyd S. Johnson Co., Chicago, Ill. Solder Flux.

o-Blast - Gas Conversion Burners. National Machine Works, Chicago,

vey, Ill. -Stokers. Whiting Corp., Har-

Locarb—Electrodes. Universal Power Corporation, Cleveland, O.

ochinvar—Furnaces and Water Heat-ers. Michigan Tank & Furnace Corp., Lochinvar Prod. Div., Detroit, Mich.

Lockaire-Insulation Board. Plastergon Wall Board Co., Buffalo, N. Y

Lock-Joint-Connectors and Mouldings for Ducts, Klomparens Lock-Joint Co., Bethesda 14, Md.

Lock-Joint—Pipe and Pipe Fittings and Accessories. Milcor Steel Co., Mil-waukee, Wis.

ektite — Damper Regulato Products Co., Cleveland, O. Regulators. Ohio

Lok-Joint — Insulating Lath. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.

LoMaintenance — Electric Motors. Al-lis-Chalmers Mfg. Co., Milwaukee,

Lorante—Chimney Caps & Tops, Ven-tilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Louver-Type-Air Conditioning Registers. United States Register Co., Battle Creek, Mich.

Lowdensite—Insulation. Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn.

Luco—Acid Brushes, Compounds, Flux, Solder. Thos. F. Lukens Metal Co., Philadelphia, Pa.

Luminare—Electrodes. Universal Power Corporation, Cleveland, O.

Lumino-Paint. Koppers Co., Pittsburgh, Pa.

Lumitall — Aluminum Paint. National Mfg. Co., Tonawanda, N. Y.

nxaire—Blower-Filters, Furnaces and Humidiflers. The C. A. Olsen Manu-facturing Co., Elyria, O.

Lyonore—Sheets. Lyon-Conklin & Co., Inc., Baltimore, Md.

Lytestone - Soldering Flux. Farrelloy Comrany, Inc., Philadelphia, Pa.

M. E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.

M & E-Compressors, Solder. Merchant & Evans Co., Philadelphia, Pa.

M.F.C.—Gas Floor Furnaces. Moncrief Furnace & Mfg. Co., Inc., Dallas, Tex.

M-H-Controls. Minneapolis-Honeywell

Regulator Co., Minneapolis, Minn. & H-Zinc Sheets. Matthies Hegeler Zinc Co., LaSalle, Ill. Matthiessen &

M & M—Humidifiers and Fittings, Noz-zles, Switches and Valves. McDonnell & Miller, Chicago, Ill.

M & S — Cork Insulation. Mitchell & Smith, Inc., Toledo, O.

M-VB-Fittings, Valves. Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.

M/W—Filters. American Air Filter Co., Inc., Louisville, Ky.

Macheta—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.

Mack-Heaters. J. V. Patten Co., Syca-

Magic Dial-Thermostats. Perfex Corporation, Milwaukee, Wis.

Magic-Weather — Air Conditioners, Blowers and Air Washers. Ballan-tyne Co., Omaha, Neb.

Majestie-Roofing, Skylights, Ventilators. W. A. Fingles, Inc., Baltimore,

Mammoth-Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.

Manganend-Electrodes. Arcos Corporation, Philadelphia, Pa.

Manganweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Marietta—Enamels and Lacquers. erican-Marietta Co., Chicago, Ill.

ark Time — Time Switches. M. H. Rhodes, Inc., Hartford, Conn.

-Metal Protecting Paints. Marley Chemical Co., Detroit, Mich.

Furnaces. Pacific Gas Heating Co., San Francisco, Calif.

Marsh Pumps, Inc., Grand Rapids, Mich.

arvel — Punches. Armstrong-Blum Mfg. Co., Chicago, Ill.

Masco — Combustion Chambers. Munn and Steele, Inc., Newark, N. J.

Mascobond-Furnace Cement and Insulation. Munn and Steele, Inc., New-ark, N. J.

Mascote—Insulating Cement and Duct Insulation. Munn and Steele, Inc., Newark, N. J.

Massachusetts—Blowers, Fans. Bishop & Babcock Mfg. Co., Cleveland, O.

aster—Built-Up Roofing. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Master—Controls, Pulleys, Thermostats. White Mfg. Co., St. Paul, Minn.

Master—Air Conditioning Furnaces.
Premier Furnace Co., Dowagiac,

Master-Hangers and Fittings. Royal-Apex Mfg. Corp., Brooklyn, N. Y.

Stokers. Muncie Gear Works, Inc., Muncie, Ind.

Master Blowertrel—Thermostatic Hydraulic Control. White Mfg. Co., Minneapolis, Minn.

Masterfil-Insulation. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Master Kraft—Air Conditioning Units, Furnaces, Colls, Oil Burners, Regu-lators and Heat Savers. Harvey-Whipple, Inc., Springfield, Mass.

Master Line-Soldering Torches. ner Brass Works, Sycamore, Ill.

Mastr-Lok — Pipe Fittings. Parkers-burg Iron & Steel Co., Parkersburg, W. Va.

Max-i-min-Furnaces. The Gehri Co., Tacoma, Wash.

Mayari R — Nickel-Chromium Sheets and Plates. Bethlehem Steel Co., Bethlehem, Pa.

Air-Dampers. Controlair, Inc., Elyria, O.

ecco—Doors and Shutters, Skylights, Ventilators. Moeschel-Edwards Co., Inc., Cincinnati, O.

eco—Gas Welding Rod, Torches. Mod-ern Engineering Co., St. Louis, Mo.

Meco Jiffy—Soldering Torches. Modern Engineering Co., St. Louis, Mo.

Mel-Reck — Fan-Filters, Ventilators and Washers. Mellish & Murray Co., Chicago, Ill.

etalestos — Pipe and Fittings. Williams-Wallace Co., San Francisco,

etal-Coat—Copper Paint. J. W. Stokes, Jr., Brooklyn, N. Y. Metal-Coat-

Metalized Primer Spray-Midland Paint & Varnish Co., Cleveland, O.

- Paint. Glidden Company, Cleveland, O.

Metal-Master—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.

Metalprep — Rust Preventative Chemi-cals. Neilson Chemical Co., Detroit, Mich

Metaphram—Draft Regulator. Minne-apolis - Honeywell Regulator Co., Minneapolis, Minn.

Metrotherm — Thermostats. General Controls Co., Glendale, Calif.

-Furnaces. Meyer Furnace Co., Peoria, Ill.

Micro-Feed-Monmouth Products Co., Cleveland, O.

max — Hygrometers and Record-Leeds & Northrup Co., Philadel-

phia. Pa. Microtrol-Damper Motors, Barber-Colman Co., Rockford, Ill.

-Thermostats. Barber-Col-Microtherm—Thermostats. man Co., Rockford, Ill.

Micro-Turret - Punches. Wiede Machine Co., Philadelphia, Pa. Wiedemann

Micro-Weld-Spot Welders. Micro Prodicts Co., Chicago, Ill.

Midget-Bending Brake. A. R. Harris, Hammond, Ind.

idget—Damper Regulators Products Co., Cleveland, O. Regulators. Ohlo

Midget-Valves. Maid-O'-Mist, Inc., Chicago, Ill.

Midget Kooler-nire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.

Mighty Midget—Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

Mighty Midget-Furnaces. Floral City Company, Monroe, Mich.

Mighty Midget Unishear—Shears. Shears. -Shears. Stan-

Mildaire-Furnaces. Parker Heating & Mfg. Co., St. Petersburg, Fla.
Milwaukee Ventilators. Milcor Steel

Co., Milwaukee, Wis.

Mineral Wool Board-Insulation. Armstrong Cork Company, Lancaster, Pa.

infelt—Insulating Cement, Insulation. Mitchell & Smith, Inc., Toledo, O.

Minnemeyer-Fittings. LaCrosse Steel Roofing & Corrugating Co., LaCrosse,

Minit Stoker-Water Heaters. Catskill Metal Works, Inc., Catskill, N. Y.

Minute—Damper Regulator Sets. Joal Mfg. Corp., Toledo, O.

Miracle-Air—Window Ventilators. Re-liable Sheet Metal Engineering Co.,

Misco-Wire Glass. Mississippi Glass Company, New York, N. Y.

Missouri Flint - Fire Brick. Chicago Fire Brick Co., Chicago, Ill.

Misteil-Oil Burners. Wayne Oil Burner Corp., Fort Wayne, Ind.

- Mixend—Electrodes. Arcos Corp., Philadelphia, Pa.
- Model-Furnaces, Heaters. Home Stove Co., Indianapolis, Ind.
- Modernair—Blower-Filter Units. Payne Furnace & Supply Co., Beverly Hills, Calif.
- ModernAire—Blower-Filters, Furnaces, Humidifiers. Des Moines Stove Repair Co., Des Moines, Ia.
- Modernaire—Air Conditioning Units, Fans. Dallas Eng. Co., Inc., Dallas, Tex.
- Modern Console—Heaters. Payne Furnace & Supply Co., Inc., Beverly Hills, Calif.
- Moderne-Aire Furnaces, Blowers. Agricola Furnace Co., Gadsden, Ala.
- Moderne-Blowers, Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.
- Modernistic—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
- Modutrol Damper Duct Motors and Fan Controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Mogul Rust Preventive Chemicals. North American Fibre Products Co., Cleveland, O.
- Moldit-Refractories. Refractory & Insulation Corp., New York, N. Y.
- Moler-Insulation. F. L. Smidth & Co., New York, N. Y.
- Monarch—Furnaces. Forest City Foundries Co., Cleveland, O.
- Monerief Furnaces. Henry Furnace Company, Medina, O.
- Monel Sheets. International Nickel Co., Inc., New York, N. Y.
- Monite—Humidifier Plates. Monmouth Products Co., Cleveland, O.
- Monitor—Furnaces. Marshall Furnace Co., Marshall, Mich.
- Monogram Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.
- Mono-Line—Duct Insulation. Quigley Company, Inc., New York, N. Y.
- Monovent Ridge Ventilators. Burt Mfg. Co., Akron, O.
- Monsoon-Louvers and Shutters. Jamleson Mfg. Co., Dallas, Tex.
- Mor-Mac-Furnaces. Morrison Steel Products, Inc., Buffalo, N. Y.
- Morning Air-Furnaces. Jackson Sheet Metal Wks., Ogden, Utah.
- Moto-Heat—Oil Burners. Brigham Oil Burner Co., St. Louis, Mo.
- Motopump—Water Circulating Pumps. Yeomans Bros. Co., Chicago, Ill.
- Yeomans Bros. Co., Chicago, III.

 Motorclay Contact Device. BarberColman Co., Rockford, Ill.
- Mototurb—Ventilators. Uno Ventilator Co., Cliftondale, Mass.
- Co., Cliftondale, Mass.

 Moyno—Pumps. Robbins & Myers, Inc.,
 Springfield, O.
- Mule Hide Caulking Compounds, Paint and Roofing. Lehon Company, Chicago, Ill.
- Multiclone—Collectors. Research Corp., New York City and Western Precipitation Corp., Los Angeles, Calif.
- Multi-Duty-Filters. American Air Filter Co., Inc., Louisville, Ky.
- Multi-Flanger-Flanging Machine. Riverside Machinery Co., Chicago.
- Multi-Plak-Diffusers. Waterloo Register Co., Waterloo, Ia.

- Multiple Star System of Welding. Electric Arc., Inc., Newark, N. J.
- Multitherm Air Conditioning Units. Clarage Fan Co., Kalamazoo, Mich.
- Multi-V-Type-Filters. Dollinger Corporation, Rochester, N. Y.
- Multivane—Blowers. B. F. Sturtevant Co., Hyde Park, Boston, Mass.
- Multi-Zone—Conditioners. Micheli Air Conditioning Co., Inc., Schenectady,
- Murex-Arc Welding Electrodes. Metal & Thermit Corp., New York, N. Y.

N

- NMC-Ventilators. The Swartwout Co., Cleveland. O.
- Nairoil—Oil Burners. National Airoil Burner Co., Philadelphia, Pa.
- National—Blowers, Furnaces. P. H. Ma-Girl Foundry & Furnace Wks., Bloomington, Ill.
- National—Furnaces, Heaters. Excelsion Stove & Mfg. Co., Quincy, Ill.
- National—Horizontal Furnaces. Stainless & Steel Products Co., Saint Paul, Minn.
- National Registers. United States Register Co., Battle Creek, Mich.
- Natroce Paint. National Mfg. Corp., Tonawanda, N. Y.
- Naturzone—Board Insulation. Wilson &
- Co., Inc., Chicago, Ill.

 Nelson Stokers. Heating Assurance,
- Spokane, Wash.

 Neme-Insulating Cement. Smith &
- Kanzler Corp., Elizabeth, N. J. Nesbit—Furnaces. Standard Furnace &
- Supply Co., Omaha, Nebr.

 Never Slip Conductor Fittings. La-
- Never Slip Conductor Fittings. Lacrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
- New American—Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.
- New Departure—Oil Burners. Aldrich Company, Wyoming, Ill.
- New Detroit—Draft Gages. Detroit Air Conditioning Service Co., Inc., Detroit, Mich.
- Newmanco-Kalamein Doors, Grilles. Newman Brothers, Inc., Cincinnati, O.
- Newton Mallets. Warren Handle Works Co., Cortland, Ohio.
- Niagara—Furnaces. Forest City Foundries Co., Cleveland, O.
- Nickelchromeweld-Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Nickelend Electrodes. Arcos Corp., Philadelphia, Pa.
- Nickeloid—Sheets. American Nickeloid Co., Peru, Ill.
- Niteair-Night Air Cooling Fans. Lau Blower Co., Dayton, Ohio.
- Nitrol—Spray Nozzles. Hubbard Company, Minneapolis, Minn.
- Noel—Arc Welders. The Ideal Electric & Mfg. Co., Mansfield, O.
- No-Flex-Registers and Faces. Hart of Cooley Mfg. Co., Holland, Mich.
- Nokorode—Flux. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.
- Non-Clogging Spray Nozzles. Link-Belt, Co., Chicago, Ill.
- Non-Con-Dux Cement, Insulation, Paper, Paste. Grant Wilson, Inc., Chicago, Ill.

- Non-Metallic Registers. Standard Stamping & Perforating Co., Chicago, Ill.
- Nonoize—Booster Fans and Blowers. American Foundry & Furnace Co., Bloomington, Ill.
- Non-Syphoning—Steel Roofing. Milcor Steel Co., Milwaukee, Wis.
- Norble Blowers, Collectors, and Air Washers. Northern Blower Co., Cleveland, O.
- Norco-Products. Northwestern Stove Repair Co., Chicago, Ill.
- Norfolk—Furnaces, Heaters, Humidiflers. Sioux City Foundry and Boiler Co., Sioux City, Ia.
- No-Rivet Damper Regulators. Ohio Products Co., Cleveland, O.
- Northland—Heaters. J. V. Patten Co., Sycamore, Ill.
- North Wind-Window Fans. American Metal Products Co., Fort Worth, Tex.
- Nor'wester Blowers. Grand Rapids,
- Die & Tool Co., Grand Rapids, Mich.
 No-Sag—Register Shields. Pentecost &
 Craft Co., Terre Haute, Ind.
- No-Site Louvers. Waterloo Register Co., Waterloo, Ia.
- No-Spat—Weld Spatter Protector. Midland Paint & Varnish Co., Cleveland, Ohio.
- No-Streak-Registers. Rock Island Register Co., Rock Island, Ill.
- No. 2000 Insulating Cement. J. H. Krehbiel Co., Chicago, Ill.
- No-Ve-U Door Ventilators. Waterloo Register Co., Waterloo, Ia.
- Novoid—Bases, Insulation. Cork Import Corp., New York, N. Y.
- Nu-Air—Air Conditioning Units. American Metal Products, Fort Worth, Tex.
- Nu-Air-Blades and Fans. Meier Electric & Machine Co., Indianapolis, Ind.
- Nu-Air—Ventilators. Milcor Steel Co., Milwaukee, Wis.
- Nu-Alpina—Gravity Roof Ventilators. Milcor Steel Co., Milwaukee, Wis.
- Nubrite—Aluminum Paint. Acorn Refining Co., Cleveland, O.
- Nu-Dry Furnace Cement. Pyrolite Products Co., Cleveland, O.
- Nu-Grip—Snips and Shears. J. Wiss & Sons Co., Newark, N. J.
- Nu-Netch-Ventilators. Knowles Mushroom Ventilator Co., Montclair, N. J.
- Nuroof—Roof Cement. Acorn Refining Co., Cleveland, O.
- Nuvent-Ventilators. Aeolus Dickinson, Chicago, Ill.
- NuSteel Stainless Cleaner. United States Steel Supply Co., Chicago, Ill.
- Nusurface Hot Surface Paint. Acorn Refining Co., Cleveland, O. Nutipe—Gas Conversion Burners. Co-
- lumbia Burner Company, Toledo, O.

 Nu-Way—Sheet Metal Products. Beatrice Steel Tank Mfg. Co., Beatrice.

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Nu-Wood — Rigid Insulation. Wood Conversion Co., St. Paul, Minn.

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- OK—Conductor Pipe Strainers. U. S. Cistern Filter Mfg. Co., Bloomington, Ill.
- P.—Stokers and Stoker-fired Furnaces. Pocahontas Fuel Company Incorporated, Cleveland, O.

Oil Chief-Furnaces. Dowagiac Steel Furnace Company, Dowagiac, Mich.

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Oil-Economy - Oil-Burning Air-Conditioning Furnace, International Heater Co., Utica, N. Y.

oil "Fire"—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Oildre Monegram — Furnaces. Quincy Stove Mfg. Co., Quincy, Ill.

Olityre—Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Oil Miser-Furnaces. Floral City Company, Monroe, Mich.

Oil-n-Aire Oil Burners. Aldrich Co., Wyoming, Ill.

Oil-O-Matic — Oil Burners. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Olympic-Furnaces. Washington Stove Works, Everett, Wash.

Olympic Bronze — Bolts, Electrodes, Plates, Sheets. Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Orsatomat—Flue Gas Analyzer. Hays Corp., Michigan City, Ind.

Out-O-Wall — Registers. Rock Island Register Co., Rock Island, Ill.

Ovaltube — Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Oxweld—Welding Apparatus. Linde Air Products Co., New York, N. Y.

Ozite - Insulation. American Hair & Felt Co., Chicago, Ill.

D

PBA Unit — Utility Room Furnace. Dowagiac Steel Furnace Co., Dowagiac, Mich.

P-K-Screws, Parker-Kalon Corporation, New York, N. Y.

P & H-Arc Welding Electrodes. Harnischfeger Corporation, Milwaukee, Wis.

P & H Hansen — Arc Welders. Harnischfeger Corp., Milwaukee, Wis.

P & R—Air Conditioning Units, Furnaces and Pumps. Pernot & Rich, Inc., Los Angeles, Calif.

Pacifelt-Insulation. Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.

Pacific Furnaces. W. W. Rosebaugh Co., Salem, Ore.

Packaged Weather - Store Coolers. General Electric Co., Bloomfield, N. J.

Paintgrip - Sheets. American Rolling Mill Co., Middletown, Ohio.

Palco Wool—Saferized—Insulation. Pacific Lumber Co., San Francisco, Calif.

Panama — Registers. United States Register Co., Battle Creek, Mich.

Paramount — Flashing. Flemm Lead Company, Inc., Long Island City, N. Y.

Paramount—Flashings. Rochester Lead Works, Inc., Rochester, N. Y.

Paramount — Hollow Metal Windows. Willis Mfg. Co., Galesburg, Ill.

Parasel—Spray Nozzles. Spraying Systems Co., Chicago, Ill.

Parce—Skylight Lifts. Park City Cornice Works, Inc., Bridgeport, Conn.

Par-Exc — Oil Furnaces. Interstate Metal Products Co., Inc., Chicago, Ill.

Parkerining-Metal treating processes. Parker Rust-Proof Co., Detroit, Mich. Parkspray—Humidistats and hygrometers. Parks-Cramer Co., Fitchburg, Mass.

Patterson — Roofing Clips. American Sheet Metal Works, New Orleans, La.

Payneheat—Heating Units. Payne Furnace & Supply Co., Beverly Hills, Calif.

Pebble-Gravity Registers, Auer Register Co., Cleveland, O.

Peer-Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.

Peerless—Blowers, Collectors, Washers. New York Blower Co., Chicago, Ill.

Peerless—Eaves Trough Hangers. Asbestos Mfg. Co., Painesville, O.

Penflex — Metal Hose. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Penn-Aire—Furnaces. Union Mfg. Co., Boyertown, Pa.

Penngun-Water Heaters. Penn Boiler & Burner Mrg. Corp., Lancaster, Pa

Penn-Mont—Slate. Structural Slate Co., Pen Argyl, Pa.

PennSalt—Rust Preventive Chemicals and Cleaners. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Pentco — Combination Snips and Punches. Penn Tool Company, Philadelphia, Pa.

Perfection—Eaves Trough Fittings and Accessories. Iwan Brothers, South Bend, Ind.

Perfection — Mineral Wool Insulation. Riverton Lime & Stone Co., Inc., Riverton, Va.

Perfect-Lap Two-Drain—Steel Roofing. Milcor Steel Co., Milwaukee, Wis.

Permat — Filters. Davies Air Filter Corp., New York, N. Y.

Permo-Aire—Filters. Air Devices, Inc., New York, N. Y.

Perry-Damper Clips and Tips. Griswold Mfg. Co., Erie, Pa.

Pet-Oil Burners. Aldrich Co., Wyo-ming, Ill.

Petro — Oil Burners, Furnaces and Water Heaters. Petroleum Heat & Power Co., Stamford, Conn.

Pexto—Metal Workers' Machines and Tools. Peck, Stow & Wilcox Co., Southington, Conn.

Philco-York — Unit Air Conditioners. Philco, Philadelphia, Pa.

Pilot-Fans, Blowers and Motors. F. A. Smith Mfg. Co., Inc., Rochester, N. Y.

Pioneer-Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.

Planeweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Planovane—Exhausters. B. F. Sturtevant Co., Hyde Park, Mass.

Plaster Bond — Compounds, Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastic-Calk — Caulking Compounds. Chamberlin Metal Weather Strip Co., Inc., Detroit, Mich.

Plastic Elastigum — Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastic PB—Cement. Barrett Div., Allied Chemical & Die Corp., New York, N. Y.

Plastiklast—Roof Cement and Waterproofing Compound. Acorn Refining Co., Cleveland, O.

Plastikroof-Roofing Paint. Evercrete Corporation, New York, N. Y. Plastiktrim—Plastic Mouldings, Trim, and Tubing and Fittings. R. F. Werner Co., New York, N. Y.

Plastite—Caulking Compounds. U. S. Stoneware Co., Akron, O.

Plastoid—Compounds, Furnace Cement. Plastic Products Co., Detroit, Mich.

Plexiform — Blowers. Bayley Blower Co., Milwaukee, Wis.

Pllavane—Grilles and Registers. Tuttle & Bailey, Inc., New Britain, Conn.

Pibrico-Plastic Fire Brick. Plibrico Jointless Firebrick Co., Chicago, Ill.

Plicant—Hearth Cement Refractories. Plibrico Jointless Firebrick Co., Chicago, Ill.

Plienst L-W-I—Insulating Refractory.
Plibrico Jointless Firebrick Co., Chicago, Ill.

Pluramelt-Stainless Clad Sheets. Allegheny Ludlium Steel Corp., Pittsburgh, Pa.

Poece — Insulation. C. W. Poe Co., Cleveland, O.

Polinr—Air Conditioning Units. Pernot and Rich, Inc., Los Angeles, Calif.

Polar Giant — Air Conditioning Units. Giant Manufacturing Co., Council Bluffs, Ia.

Portage — Furnaces. XXth Century Heating & Ventilating Co., Akron, O.

Positive Are—Arc Welders. Welding Apparatus Co., Chicago, Ill.

"Power-Flex"—Stokers. Link-Belt Co., Chicago, Ill.

Powerstat-Valves. Mercoid Corp., Chicago, Ill.

Precipitron — Automatic Air Filter. Westinghouse Electric & Manufacturing Co., Cleveland, O.

Premier—Electrodes and Welding Rod. American Steel & Wire Co., Cleveland, O.

Premier — Furnace Vacuum Cleaner. Electric Vacuum Cleaner Co., Inc., Cleveland, O.

Premier Automatik—Stoker-Fired Air Conditioning Furnaces. Premier Furnace Co., Dowagiac, Mich.

Premier DeLuxe — Furnaces. Premier Furnace Co., Dowagiac, Mich.

Premier Master - Furnaces. Premier Furnace Co., Dowagiac, Mich.

Pre-Notch—Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.

Preprite — Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.

Prepwash—Rust Preventive Chemicals. Neilson Chemical Co., Detroit, Mich.

Presstice—Furnace and Roof Cement, Compounds, Paint. Presstite Engineering Co., St. Louis, Mo.

Presteel-Metal Stampings. Worcester Pressed Steel Co., Worcester, Mass.

Presteel — Fan Housings. Commercial Shearing & Stamping Co., Youngstown, Ohio.

Prest-O-Lite—Soldering Coppers, Soldering Torches, Welding Equipment. Linde Air Products Co., New York, N. Y.

Prest-O-Weld—Oxy-Acetylene Welding Equipment, Torches, Linde Air Products Co., New York, N. Y.

Prince—Hydrometers, Psychrometers, Electric Relays, Thermometers and Themostats. Precision Thermometer and Instrument Co., Philadelphia, Pa.

- Properaire Blowers. Grand Rapids Die & Tool Co., Grand Rapids, Mich.
- Protection Soldering Furnaces and Torches. Clayton & Lambert Mfg. Co., Dearborn, Mich.
- Protectolite Thermostats. Sampsel Time Control, Inc., Spring Valley, Ill.
- Protectomotor-Filters. Dollinger Corporation, Rochester, N. Y.
- Protector-Snow Guards. David Levow, New York, N. Y.
- Protectorelny Electric Relays. Minneapolis Honeywell Regulator Co., Minneapolis, Minn.
- Proxin—Enamels & Lacquers. Acme White Lead and Color Works, Detroit. Mich.
- Pul-Air—Ventilators. Lyons, Conklin & Co., Inc., Baltimore, Md.
- Pul-Air-Ventilators. Penn Ventilating Co., Philadelphia, Pa.
- Pulversone—Stokers. American Coal Burner Co., Chicago, Ill.
- Punchawl-Tools. Hub Specialty Co., Somerville, Mass.
- Punkah Louvres. Kelvin-White Co., Boston, Mass.
- Purox—Oxy-Acetylene Welding Equipment and Torches. Linde Aid Products Co., New York, N. Y.
- Pyralux—Enamels and Lacquers. E. I. du Pont de Nemours & Co., Wilmington, Del.
- Pyrobar—Roofing Tile. United States Gypsum Co., Chicago, Ill.
- Pyrofelt—Furnace Insulation. Mitchell & Smith, Incorporated, Toledo, O.
- Pyrotron Temperature Recorders. Bailey Meter Co., Cleveland, O.

C

- Q-Chrome-Insulating Cement. Quigley Company, Inc., New York, N. Y.
- Q-Chromatic Insulating Cement.
 Quigley Company, Inc., New York,
 N. V.
- Q-Deck-Roofing. H. H. Robertson Co., Pittsburgh, Pa.
- Q-T Ductliner—Celotex Corp., Chicago, Ill.
- Quaker Burnoil Oil Burners, Furnaces and Heaters. Quaker Mfg. Co.. Chicago, Ill.
- Quaker City—Eaves Trough and Gutters, Conductor Fittings and Accessories, Pipe, Ridge Rolls and Ridging. Berger Brothers Company, Philadelphia, Pa.
- Queen City-Shears. Niagara Machine & Tool Works, Buffalo, N. Y.
- Quick Heat—A. C. Furnace. American Stove Co., Loraine, O.
- Quick Heater—Oil Burners. Quick Furnace & Supply Company, Des Moines, Iowa.
- Quick-Set-Dividers. Reiner & Campbell, Inc., Elizabeth, N. J.
- Quickwork—Shears and Sheet Metal Machines. Whiting Corporation, Harvey, Ill.
- Quiet-Air Furnace Blowers. Maple City Stamping Co., Peoria, Ill.
- Quiet May—Air Conditioning Furnaces, Units, Oil Burners. May Oil Burner Corp., Baltimore, Md.
- Quiet Zone-Blowers. Palmer Manufacturing Co., Phoenix, Ariz.
- "Quilt"—Insulation. Samuel Cabot, Inc., Boston, Mass.

R

- R & G Grilles, Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- RBC-Bearings. Roller Bearing Co. of America, Trenton, N. J.
- r/h Furnaces. Rybolt Heater Company, Ashland, Ohio.
- R.I.W.—Paint and Waterproofing. Toch Bros., Inc., Elm Pk., S. I., N. Y.
- R. I. W. Liquir Konkerit—Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.
- R. I. W. Plug-A-Leak-Roofing Paint. Toch Bros., Inc., Elm Pk., S. I., N. Y.
- R & I—Furnace Cement and Insulation. Refractory & Insulation Corp., New York, N. Y.
- R & I-Nutipe—Combustion Chambers. Refractory & Insulation Corp., New York, N. Y.
- R & M-Motors. Robbins & Myers, Inc., Springfield, O.
- R.M.C.—Burners. Rotary Mfg. Co., Los Angeles, Calif.
- RP-Filters. Research Products Corporation, Madison, Wis.
- RPM-Flashing and Roofing Steel. H. H. Robertson Co., Pittsburgh, Pa.
- R-R-M Hygrometers, Psychrometers. The Palmer Co., Cincinnati, O.
- "R" Series Furnaces. Sure Comfort Furnace Co., Berwyn, Ill.
- R-U-F Fans and Ventilators. Reed Unit-Fans, Inc., New Orleans, La.
- Race—Air Conditioning Units and Gas Furnaces. Royal Air Conditioning Equipment, Alhambra, Calif.
- Radiation Discs—Stoker Baffles. Munn and Steele, Inc., Newark, N. J.
- Radi-Ion-Ozone Apparatus. Montgomery Brothers, San Francisco, Calif.
- Radolite—Insulating Cement and Refractories. Pyrolite Products Co., Cleveland, O.
- Radiant Heat—Baffles. Jones Products Company, Ferndale, Mich.
- Rainbow Mist—Nozzles. National Engineering & Manufacturing Co., Kansas City, Mo.
- RainSeal Roofing. Reeves Steel & Mfg. Co., Dover, Ohio.
- Raintite Roof Ventilators. Aeolus Dickinson, Chicago, Ill.
- Ralpo-Sheet Metal Cutters. Ralph W. Poe, Canton, Ill.
- Ramee Chimney Caps and Tops. Royal-Apex Mfg. Corp., Brooklyn, N. Y.
- Ranarex—CO₂ Analyzers. Permutit Co., New York, N. Y.
- Rapid Fire Furnaces and Heaters. Reynolds Mfg. Co., Springfield, Mo.
- Ratox—Venetian Blinds. Hough Shade Corp., Janesville, Wis.
- Rawl-Anchors Bolts. Rawlplug Company, Inc., New York, N. Y.
- Rawl-Drive—Masonary Nails and Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.
- Rawl-Tapers—Expansion Bolts. Rawlplug Co., Inc., New York, N. Y.
- Reactance Are—Portable Welders. Miller Electric Mfg. Co., Inc., Appleton, Wis.
- Readyweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Reco Fans and Motors. Reynolds Electric Co., Chicago, Ill.

- Recoy—Air Conditioning Units and Colls. Refrigeration Economics Co., Inc., Canton, O.
- Red Devil Furnace Cement. Pecora Paint Co., Philadelphia, Pa.
- Redi-Stokers. General Machinery Co., Spokane, Wash.
- Redi-Lift Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
- Redi-Nail—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.
- Redi-Paint—Prime Paint for Galvanized Surfaces. Turco Products, Inc., Los Angeles, Calif.
- Redi-Set Rivet Squeezer. Whitney Metal Tool Co., Rockford, Ill.
- Red Metallic Roofing Paint. Clinton Metallic Paint Co., Clinton, N. Y.
- Redox-Paint. Thompson & Co., Pittsburgh, Pa.
- Red-Rending-Mercury Hygrometers, Psychrometers, and Thermometers. The Palmer Co., Cincinnati, O.
- Red Seal-Sheets. Benjamin Wolff and Company, Chicago, Ill.
- Red Top-Thermostats. H-B Instru-Gypsum Co., Chicago, Ill.
- Red Top Thermostats. H-B Instrument Company, Philadelphia, Pa.
- Red X-Cleaners and Polishers. Turco Products, Inc., Los Angeles, Calif.
- Reformend—Electrodes. Arcos Corp., Philadelphia, Pa.
- Rege Brazing Torches. National Cylinder Gas Co., Chicago, Ill.
- Rego Flux. Bastian-Blessing Co., Chicago, Ill.
- Reillaloy-Stove and Furnace Repairs.
 Pittsburgh Furnace Parts Co., Pittsburgh, Pa.
- Renu-Filters. American Air Filter Co., Inc., Louisville, Ky.
- Renuvent-Steel Wool Filters. American Air Filter Co., Inc., Louisville, Kv.
- Republic Gas Conversion Burners. Autogas Corp., Chicago, Ill.
- Republic-Taylor—Terne Roofing Plates. Republic Steel Corporation, Cleveland, O.
- Resiscote—Paint. Reilly Tar & Chemical Corporation, Indianapolis, Ind.
- Rex—Bearings, Pillow Blocks, Blower-Filter Units, Blowers, Fan-Filter Units, Blower Wheels, Air Controls, Inc., Cleveland, O.
- Rex-Bearings, Couplings and Nozzles. Chain Belt Co., Milwaukee, Wis.
- Rex-Furnaces. Calkins & Pearce, Columbus, O.
- Rex-Airate Fans, Ventilators. Air Controls, Inc., Cleveland, O.
- Rex-Air-Pak—Blower Units. Air Controls, Inc., Cleveland, O.
- Rexec-Refractories. Rex Clay Products Co., Detroit, Mich.

 Rexide-Metal Protecting Paint. A. C.
- Horn Co., Long Island City, N. Y. Rexoll—Oil Burners, Furnaces. Reif-
- Rex-Reto—Combustion Chambers, Refractories. Rex Clay Products Co., Detroit, Mich.
- Rexvane—Blowers. B. F. Sturtevant Co., Boston, Mass.
- Rex Vibra-Sorbers Vibration Eliminating Metal Hose. Chicago Metal Hose Corporation, Maywood, Ill.

Rex-Weld-Coils. Chicago Metal Hose Corporation, Maywood, Ill.

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Rexwelders — Spot Welders. Dyer Welder & Engineering Co., Kansas City, Mo.

Reyn-O-Cell — Insulation. Reynolds Metals Co., Richmond, Va.

Reynolds - Ducts and Duct Fittings, Dampers. Richmond Radiator Co., Inc., Uniontown, Pa.

ezistal — Stainless Steels. Crucible Steel Co. of America, New York, N. Y.

Rhinamel-Enamels. Tropical Paint & Oil Co., Cleveland, O.

Rhine — Caulking and Glazing Compounds. Pecora Paint Co., Philadelphia, Pa.

Rich-Con-Ventilators. A-J Mfg. Co., Kansas City, Mo.

Ridgelator — Ridge Roof Ventilator. Klauer Mfg. Co., Dubuque, Ia.

Rincon-trol — Enamels and Lacquers. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.

RiP-Clean-Filters. Research Products Corporation, Madison, Wis.

Rip-o-Lin-Enamels. Glidden Company, Cleveland, O.

Rip-pl-Enamels, Lacquers and Paints. Hilo Varnish Corp., Brooklyn, N. Y.

Riverside - Furnaces. Rock Island Stove Co., Rock Island, Ill.

Robinson—Brakes, Presses and Dies, Punches. New Albany Machine Mfg. Co., New Albany, Ind.

Rocan — Copper Roofing and Sheets. Revere Copper and Brass Incorporated, New York, N. Y.

-Paint Spray Guns. Binks Mfg. Co., Chicago.

Rocktex-Insulation. Philip Carey Co., Lockland, Cincinnati, O.

Rollaire — Air Conditioning Furnaces. Hipoint Corp., Bellefontaine, O.

Roof Flange — Flashing. Eagle-Picher Lead Co., Cincinnati, O.

Roofkoter - Paint. Tropical Paint & Oil Co., Cleveland, O.

Roof-Vent — Ventilators. Reed Unit-Fans, Inc., New Orleans, La.

Rosetop — Ventilators. Danzer Metal Works Co., Hagerstown, Md.

Rotary—Gravity Ventilators. The Swartwout Co., Cleveland, O.

Suction-Ventilators. F. O. Schoedinger, Columbus, O.

Rotex—Punches and Shears. M. Bollaert, Oakland, Calif.

Roto—Insulating Cement and Combus-tion Chambers. Rex Clay Products Co., Detroit, Mich.

Roto-Blast — Furnaces. Moncrief Furnace Co., Atlanta, Ga.

Roto-Clone-Dust Collectors. Air Filter Co., Inc., Louisville, Ky.

Rotojet-Nozzles. Binks Mfg. Co., Chi-

Roxaprene—Enamels and Lacquers. Roxaline Flexible Finishes, Inc., Elizabeth, N. J.

Royal—Caulking Compounds, Cement, Enamels, Lacquers, Waterproofing, Enamels, Lacquers, Waterproofing, Paint. A. Wilhelm Co., Reading, Pa.

Royal-Furnaces. Hart & Crouse Corporation, Utica, N. Y.

Royalastic-Roof Cement. A. Wilhelm Co., Reading, Pa.

Reyalbestos-Furnace Cement. A. Wilhelm Co., Reading, Pa.

Royal Blue—Acid and Furnace Brushes. Schaefer Brush Mfg. Co., Milwaukee,

Royal Clipper-Metal Cutter. C-B Tool Co., Lancaster, Pa.

Rubalt—Enamels, Lacquers and Paint. Alfred Hague & Co., Inc., Brooklyn, N. Y.

Rubyfluid—Solder, Soldering Flux, Tin-ning Compounds. Ruby Chemical Co., Columbus, O.

Rudico-Furnaces. Rudy Furnace Co., Dowagiac, Mich.

Rudisteel - Furnaces. Rudy Furnace Co., Dowagiac, Mich.

Rudy-Ventilators. Accurate Mfg. Works, Chicago, Ill.

Ruseo-Windows. Russell Co., F. C., Cleveland, O.

Rustnil—Paints. National Engineering Products, Inc., Washington, D. C.

-Sheets. The Superior Sheet Steel Co., Canton, O.

S C - Furnaces. Surface Combustion, Toledo, O.

S-E-Gravity Roof Ventilators. W. Hirschman Co., Inc., Buffalo, N. Y.

SF—Soldering Coppers, Torches, Welders. Sight Feed Generator Co., Richmond, Ind.

S. I. S.—Cement. Barrett Div., Allied Chemical & Die Corp., New York,

L — Bar Folders, Nibblers, Slitting Machines. St. Louis Tool Co., St. Louis, Mo.

S-N-Furnaces, Oil Burners, Stoker Scott-Newcomb, Inc., St. Louis, Mo. Stokers.

S O S-Variable Speed Pulleys. Ideal Commutator Dresser Co., Sycamore,

SRP-Metal Protecting Paint. L. Son-neborn Sons, Inc., New York, N. Y.

Safety Circle-Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

-Mallets. Martin Bersted Co., Chicago, Ill.

t. Louis — Stoker. Ormsby-Osterman Co., St. Louis, Mo.

Sair Seal-Insulating Cement. A. Green Fire Brick Co., Mexico, Mo.

Sal-Mo-Cement, Insulation, Pipe Co-verings. Sall Mountain Co., Chicago,

Sameo — Cement. Standard Asbestos Mfg. Co., Chicago, Ill.

Sampson—Furnace Brushes. Worcester Brush & Scraper Co., Worcester,

Sanidaire—Humidifiers. U. S. Air Conditioning Corp., Minneapolis, Minn.

aran—Plastic Tubing and Fittings. Acadia Synthetic Products Div., Chicago, Ill. Dow Chemical Co., Midland, Mich. Skuttle Mfg. Co., Detroit, Mich. Hodgman Rubber Co., Framingham,

-Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

Sauter-Time Switches. R. W. Cramer Co., Inc., Centerbrook, Conn.

Sav-Haf - Oil Burners. Aldrich Co., Wyoming, Ill.

Scaiffux-Soldering Flux. Scaife Co., Oakmont, Pa.

Schmidt-Soldering Coppers, Soldering and Brazing Torches. Minn-Köta and Brazing Foundry & Mfg. Co., Fargo, N. D.

Sco-Co-Roof Cement, Compounds, Paint, Roofing and Waterproofing. Southport Paint Co., Savannah, Ga.

Scroll-Pivoter—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Scruplex-Fans and Ventilators. L. Wing Mfg. Co., New York, N. Y.

Sea-Lion—Leather Belting. Chicago Belting Co., Chicago.

Seal Master-Bearings. Stephens-Adamson Mfg. Co., Aurora, Ill.

Seal of Quality - Roofing. Columbia Steel Co., San Francisco, Calif.

Sealpruf-Waterproofing. General Insulating Products Co., Brooklyn, N. Y.

Seal-Tite—Registers. Char-Gale Mfg. Co., Minneapolis, Minn.

Seal-Tite-Roof Cement. C. Arthur Miller & Son, Elmira, N. Y.

Seamless — Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

Security—Caulking and Roofing. National Mfg. Corp., Tonawanda, N. Y.

Seisme-Dampers — Vibration Isolating Bases. Korfund Co., Inc., Long Island City, N. Y.

Selectair—Air Conditioning Units and Oil Furnaces. S. T. Johnson Co., Oakland, Calif.

Self-Cleaning-Furnaces. Moore Corp.,

Self-Seal Re-Fil-Able — Filters. Re-search Products Corporation, Madison, Wis.

Self-Stoker - Furnaces. Viking Manufacturing Corporation, Dayton, O.

Selfvule — Waterproofing Compounds, Paint. Self-Vulcanizing Rubber Co., Inc., Chicago, Ill.

Semco—Crimping and Slitting Ma-chines, Presses and Dies, Punches, Snips and Shears. Service Machine Co., Elizabeth, N. J.

Thermostats. Mercoid Corp., Chicago, Ill.

Sensitrol-Electrical Relays. Weston Electrical Instrument Corp., Newark,

entinel — Floor Furnaces. Stoker-Lad Co., Tacoma, Wash. Sentinel -

Payne Furnace & -Furnaces. Supply Co., Beverly Hills, Calif.

Series "H"-Coils. John J. Nesbitt, Inc., Philadelphia, Pa.

Series "W"-Coils. John J. Nesbitt, Inc., Philadelphia, Pa.

70 Serviceman-Recording Thermostat. Jas. P. Marsh Corp., Chicago, Ill.

Serviron—Plastic Coating. Saverite Engineering Co., Hoboken, N. J.

Sheetrock-Duct Board. United States Gypsum Co., Chicago, Ill.

hield-Are — Electrodes and Welders. Lincoln Electric Co., Cleveland, O. Shield-Are-

Shock Absorbing-Pillow Blocks. Tri-angle Mfg. Co., Oshkosh, Wis.

Shock Pads-Vibration Isolating Pads. Vibration Engineering Co., York, N. Y. New

Shower-Proof-Paint. Calbar Paint & Varnish Co., Philadelphia, Pa.

Shur-Heat-Stokers. Air Conditioning & Stokers, Inc., St. Louis, Mo.

- Shut-O-Vent Louvers and Shutters. Reed Unit-Fans, Inc., New Orleans, La.
- Sievert Soldering Furnaces and Torches. Van Praag Sales, New York, N. Y.
- Silent—Furnace Blowers. Air Conditioning Equipment Co., Minneapolis, Minn.
- Silent Air—Fans and Blades. Belanger Fan & Blower Co., Detroit, Mich.
- Silentair—Blowers, Filters. Gehri Co., Tacoma, Wash.
- Silentaire—Window Ventilator and Filter Units. Berger Mfg. Div., Republic Steel Corp., Canton, O.
- Silent-Auburn—Oil Burners, Furnaces, Heaters. Auburn Burner Co., Auburn, Ind.
- Silent Automatic Fire Doors and Shutters. Meyer Mfg. Co., Detroit, Mich.
- Silent Automatic—Louvers & Shutters.
 Airecon Industries, Inc., Detroit,
 Mich.
- Silentblu-Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
- Silentvane-Blowers. B. F. Sturtevant Co., Boston, Mass.
- Silere—Fans. Aire-Foile Fan & Blower Company, Detroit, Mich.
- Sil-Fos-Solder. Handy & Harman, New York, N. Y.
- Silicair Insulation. Western Silicair Products, Inc., Burbank, Calif.
- Siloy-Soder—Solder. L. B. Allen Co., Inc., Chicago, Ill.
- Silver-Ply-Stainless Clad Sheets. Jessop Steel Co., Washington, Pa.
- Silver-Soder—Solder, L. B. Allen Co., Inc., Chicago, Ill.
- Silver Steel—Saws. E. C. Atkins & Co., Indianapolis, Ind.
- Silver-Seal-Aluminum Paint. Asphalt Products Co., Syracuse, N. Y.
- Simplex Quadrants. Ohio Products Co., Cleveland, O.
- Simplate—Pneumatic Hammer. Chicago Pneumatic Tool Co., New York, N. Y.
- Simplex—Humidifiers. Henry Kraker, Holland, Mich.
- Simplex-Insulation. Keasbey & Mattison Co., Ambler, Pa.
- Simplex-Stoker. Stoker Products, Inc., Decatur, Ill.
- Sim-trol—Smoke Pipe Draft Regulators, Simplex Mfg. Co., Fond du Lac, Wis.
- Sioux-Drills, Grinders, Sanders. Albertson & Co., Inc., Sioux City, Ia.
- Sirocco—Air Conditioning Units, Blowers, Fans, Ventilators, Washers. American Blower Corp., Detroit, Mich.
- Skildrill—Electric Drill. Skilsaw, Inc., Chicago, Ill.
- Slaters' Felt-Insulation. Barrett Div. Allied Chemical & Die Corp., New York, N. Y.
- Smith & Hemenway-Tools. Crescent Tool Co., Jamestown, N. Y.
- Smith's—Torches, Welders and Equipment. Smith Welding Equipment Co., Minneapolis, Minn.
- Snaplok Furnace Pipe. Reeves Steel & Mfg. Co., Dover, O.

- Snapon-Mouldings & Trim. John Lees Div., Serrick Corp., Muncie, Ind.
- Snap-Rite Ducts, Pipe and Fittings. Gray Metal Products, Inc., Rochester, N. Y.
- Snap-Tite—Damper Regulators, Clips and Tips. M. A. Gerett Corp., Milwaukee, Wis.
- Sno-Breze—Air Conditioning Units, Coils. Palmer Mfg. Corp., Phoenix, Ariz.
- Snug-Fit Coils. Hotstream Heater Co., Cleveland, O.
- Softweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Sciaraire Air Conditioning Furnace. St. Louis Furnace Mfg. Co., St. Louis,
- Solderprep Flux for Steel. Neilson Chemical Co., Detroit, Mich.
- Solid Asphalt Waterproofing. Ford Roofing Products Co., Chicago, Ill.
- Solid Comfort Furnaces. May-Fiebeger Co., Newark, O.
- Sono-O-Seal-Insulation. General Insulating Products Co., Brooklyn, N. Y.
- Soroco Chimney Taps and Tops. Southbridge Roofing Co., Southbridge,
- So Salts—Tinning Compound and Flux. Turco Products, Inc., Los Angeles, Calif.
- Southaire—Stokers. E. E. Souther Iron Co., St. Louis, Mo.
- Sovaklor-Protecting Paint Metal. Socony Paint Products, New York, N. Y.
- Sovalex-Metal Protecting Paint. Socony Paint Products, New York, N. Y.
- Spacesaver—Heating Unit. Payne Furnace & Supply Co., Beverly Hills, Calif.
- Spatter-Nox-Welding Compound. Universal Power Corp., Cleveland, O.
- Spatter-Off-Welding Compound. Universal Power Corp., Cleveland, O.
- Spatterfilm-Electrodes. Lincoln Electric Co., Cleveland, O.
- Special X-Solder. Industrial Service Laboratories, Milwaukee, Wis.
- Speco Soldering Flux. Pfanstieh Chemical Co., Waukegan, Ill.
- Spedene—Glazing Compound. Glidden Co., Cleveland, O.
- Speedarc—Electrodes. Universal Power Corporation, Cleveland, O.
- Speed Clips—Spring Steel Fastenings.
 Tinnerman Products, Inc., Cleveland,
- Spee Dee-Coils. Air Controls, Inc., Cleveland, O.
- Speed-heat-Furnaces. Marshall Furnace Co., Marshall, Mich.
- Speed-Master—Asphalt and Pitch Kettles. Hauck Mfg. Co., Brooklyn, N. Y. Speed Nuts—Sheet Metal Nuts. Tin-
- nerman Products, Inc., Cleveland, O. Speed-Up—Concrete Waterproofing Cement. Hilo Varnish Corp., Brooklyn,
- Sphinx—Blower-Filter Units, Burners, Furnaces. C. L. Bryant Corp., Cleveland. O.
- Spinner—Ceiling Ventilators. Milcor Steel Co., Milwaukee, Wis.
- Spirovane—Ventilating Fans. Western Blower Co., Seattle, Wash.

- Sprague—Furnaces. Katelman Foundry & Mfg. Co., Council Bluffs, Ia.
- Sprayit—Paint Guns and Humidifiers. Electric Sprayit Co., Sheboygan, Wis.
- Spra-Rite Nozzles. Binks Mfg. Co., Chicago, Ill.
- Stable-Arc Arc Welding Electrodes, Arc Welders. Lincoln Electric Co., Cleveland, O.
- Stack Heet-Heat Savers. Robert Barclay, Inc., Chicago.
- Sta-Gloss Stainless Sheets. Jessop Steel Co., Washington, Pa.
- Staidare—Electrodes. Universal Power Corporation, Cleveland, O.
- Stainare—Electrodes. Universal Power Corporation, Cleveland, O.
- Stainlend-Electrodes. Arcos Corporation, Philadelphia, Pa.
- Stainweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Sta-Lock Prefabricated Ducts and Duct Fittings. Chicago Furnace Supply Co., Chicago, Ill.
- Stamco-Furnace Pipe, Fittings. Cincinnati Stamping Co., Cincinnati, O.
- Stameo-Sheet and Plate Machinery.
 Streine Tool & Mfg. Co., New Bre-
- Standard—Furnaces. Aladdin Heating Corp., Oakland, Calif.
- Standard Furnaces. Farris Furnace Co., Springfield, Ill.
- Standard—Furnaces. Home Furnace Co., Holland, Mich.
- Standard-Ventilators. Allen Corp., Detroit. Mich.
- Standard Topton Furnaces. Klein Stove Co., Philadelphia, Pa.
- Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.
- Star-Soldering Furnaces. Burgess Soldering Furnace Co.; Columbus, O.
- Star-Ventilators. Merchant & Evans Co., Philadelphia, Pa.
- Staynew-Filters. Dollinger Corpora-
- Steelcore Galvanized Steel Shingles. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Steel-Fin-Heating Coils. New York Blower Co., Chicago, Ill.
- Steelmaster—Shingles and Tile. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Steel Mixture—Baffles and Refractories. McLeod & Henry Co., Inc., Troy, N. Y.
- Sterling Beader-Beading Machines. F. L. Robertson, Buffalo, N. Y.
- Sterling Evaporative Coolers and Compressors. Reynolds Mfg. Co., Springfield, Mo.
- Steward-Presses and Dies. Ward Machinery Co., Chicago, Ill.
- Stewart-Furnaces. Fuller-Warren Co., Milwaukee, Wis.
- Stic-Tite—Cement Refractory & Insulation Corp., New York, N. Y.
- Stokabilt—Air Conditioning Stoker Furnaces. American Foundry & Furnace Co., Bloomington, Ill.
- Stok-A-Timer-Stoker Controls. Mercold Corp., Chicago, Ill.

Stoker Economy-Stoker Furnaces. In-ternational Heater Co., Utica, N. Y.

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Stoker Fire — Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Stoker-Ola-Stokers. Advance Appliance Co., Peoria, Ill.

Stokerator-Domestic Stokers. North-ern Steel & Stoker Corp., Peoria, Ill.

Stokerelay—Relays. Minneapolis-Hon-eywell Regulator Co., Minneapolis, Minn.

-Water Heaters. Schwitzer-Cummins Co., Indianapolis, Ind.

Stekel Hydraulie—Stokers. Schwitzer-Cummins Co., Indianapolis, Ind.

Stokel Mercury — Stokers, Schwitzer-Cummins Co., Indianapolis, Ind.

tonewall — Asbestos-Cement Board. Ruberoid Co., New York, N. Y. Stonewall .

StormSeal - Roofing Steel. Steel Co., San Francisco, Calif.

Stormtight-Roof Cement. L. Sonne-born Sons, Inc., New York, N. Y.

Stowaway — Attic Furnaces. Lennox Furnace Co., Marshalltown, Ia.

Strate-Edge — Eaves Trough and Gut-ters. Milcor Steel Co., Milwaukee, Wis.

Strate-Liminator—Air Diffusers. Wilster Air Devices, Inc., Cleveland, O.

Streamaire—Air Conditioning Units and Coils. Young Radiator Co., Racine, Wis.

Stream-Flo-Ventilators. The Allen Corporation, Detroit, Mich.

reamline—Furnaces. Aladdin Heating Corp., Oakland, Calif.

reamline—Ridge Ventilators. H. H. Robertson Co., Pittsburgh, Pa.

reamlined—Furnaces. Sure Comfort Furnace Co., Berwyn, Ill.

treekno—Register Packing. Excel Heating & Air Conditioning Co., Chi-cago, Ill.

Sturdybender—Presses. Cyril Bath & Co., Cleveland, O.

ullare—Electrodes. Universal Power Corporation, Cleveland, O.

unbeam — Furnaces, Blower-Filters, Oil Burners, Heaters and Humidifi-ers. American Radiator and Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Allerton—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Arifagion—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Bayport — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Chippewa—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Cliffdale — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Clifton—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Elwood-Oil Floor Furnaces.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Kenwood—Furnaces, Heaters.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Longwood—Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Mohawk — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Saginaw — Gas Floor Fur-American Radiator & Stand-Sunbeam-Sag'inaw -naces. American ard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Saratoga — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Seneca—Furnaces. · American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Shawnee — Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam - Westmoreland — Furnaces.

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunbeam-Wyandotte-Furnaces. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sun Fuel Master — Furnaces and Heaters. J. V. Patten Co., Sycamore, Ill.

Sunglo-Furnaces. Moore Corp., Joliet,

anrise—Gas and Oil Burners. Kais Sunrise Works, Detroit, Mich.

aper—Hangers and Fittings. Roy. Apex Mfg. Corp., Brooklyn, N. Y.

Super-Plastic Furnace Lining. Walsh Refractories Corp., St. Louis, Mo.

ler, Inc., Grand Haven, Mich.

sperair — Air Conditioning Furnaces. St. Louis Furnace Mfg. Co., St. Louis, Mo.

Supernir - Blower-Filter Units. The Majestic Co., Huntington, Ind.

Super Air Screws — Ventilating Fans. Marathon Electric Mfg. Corp., Wau-

Superbrite - Aluminum Paint. Acorn Refining Co., Cleveland, O

Superbrite No. 150 — Metal Protecting Paint. Acorn Refining Co., Cleveland,

Superfex-Furnaces. Heaters. tion Stove Co., Cleveland, O.

Superfin-Furnaces, American Fdry. & Furnace Co., Bloomington, Ill.

Super Firma—Gravity Roof Ventila-tors. W. F. Hirschman Co., Inc., Buf-falo, N. Y.

Superflux N. 0, 215 — Soldering Flux.
-Paul Lewis Laboratories, Inc., Milwaukee, Wis.

Superheat—Furnaces. Dallman Supply Co., Sacramento, Calif.

Super-Nickel Fittings. Brass Co., Waterbury, Conn.

Super-Quiet-Oil Burners. nial Furnace Co., Des Moines, Ia.

Super Red Streak — Furnace Cleaners. National Super Service Co., Toledo, O.

Superior—Blowers. American Foundry & Furnace Co., Bloomington, Ill.

Superior — Sheets. Continental Steel Corp., Kokomo, Ind.

Superior—Soldering Furnaces and Torches. P. Wall Mfg. Supply Co., N. S. Pittsburgh, Pa.

Superlife Furnace. Excelsion Steel Furnace Co., Chicago, Ill.

Super Red Streak — Furnace Vacuum Cleaners. National Super Service Co., Cleaners. I

Super-Therme - Refractory. Chicago Fire Brick Co., Chicago, Ill.

Super X-Industrial Coating. B. F. Nelson Mfg. Co., Minneapolis, Minn.

Super-X-Roofing Nails. Republic Steel Corporation, Cleveland, O.

Super X — Sheets. Western Cartridge Company, Brass Mill Div., East Alton,

upreme—Furnaces. American Furnace & Foundry Co., Milan, Mich.

Supreme—Furnaces, Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

nace & Supply Co., Portland, Ore.

wredrane—Roofing. Reeves Steel & Mfg. Co., Dover, O.

Surelok-Furnace Pipe. Reeves Steel & Mfg. Co., Dover, O.

Sureweld—Are Welding Electrodes. National Cylinder Gas Co., Chicago,

Surfaceol — Waterproofing Compound. Gerard Chemical Co., Elizabeth, N. J.

Surfaceweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Swedgers-Packam Crimper Company,

Mechanicsburg, O. Sylphon—Controls, Damper Regulators, Thermostats and Valves. Fulton Syl-phon Co., Knoxville, Tenn.

Symentrex—Waterproofing Compounds.
A. C. Horn Co., Long Island City,
N. Y.

Synchron—Stoker Controls, Relays, Switches. Industrial Engineering Corp., Terre Haute, Ind.

Synchron "600"—Timing Machines and Motors. Hansen Mfg. Co., Inc., Princeton, Ind.

SyncreTizer—School Room Heaters.
John J. Nesbitt, Inc., Philadelphia,

Symonds-Registers. Front Rank Furnace Co., Div., Liberty Foundry Co., St. Louis, Mo.

tafco-Air Filters. Tuttle Air Filter Co., Inc., Louisville, Ky.

Tag-Controls, Humidistats, Hygrometers, Recorders, Psychrometers, Thermometers, Thermostats and Gas Pressure Regulating Valves. C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

Tamanite—Metal Conditioner. Silica Company, Chicago, Ill.

Ventilators. Tiffin Eaves Trough Clamp Co., Tiffin, O.

-Filters. Chicago Filter Co., Joliet, Ill.

Tanco-Paint. Thompson & Co., Pittsburgh, Pa.

Taylor - Roofing Ternes. Republic Steel Corporation, Cleveland, O.

Techni-Louvre—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Techni-Turn-Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Techni-vane—Duct Turning Vanes. Waterloo Register Co., Waterloo, Ia.

Technotrol-Electric Clock Thermostat.

White Mfg. Co., St. Paul, Minn.

- Tee Joint-Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.
- Teitru—Psychrometers and Thermom-eters. E. Vernon Hill, Chicago, Ill.
- Tem-Clock Controls. Penn Electric Switch Co., Goshen, Ind.
- Furnaces. Tennessee Enamel Temco-Mfg. Co., Nashville, Tenn.
- Temlok-Insulation. Armstrong Cork
- Co., Lancaster, Pa. Tempered-Aire—Furnaces. Gar Wood Industries, Inc., Detroit, Mich.
- Tempryte-Heat Insulating Windows. Truscon Steel Co., Youngstown, O.
- Temtrol—Thermostats. P. Switch Co., Goshen, Ind. Penn Electric
- 10-Plastie—Caulking Compounds. Quig-ley Co., Inc., New York, N. Y.
- Tensulate—Insulation. Tennessee Products Corp., Nashville, Tenn.
- Texrope exrope—V-Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- Tharco-Furnace Cement. The Arm-
- strong Company, Detroit, Mich. The General-Furnaces. General Heat-
- ing Products Co., Minneapolis, Minn. "The Pacific"-Furnaces. W. W. Rose-
- braugh Co., Salem, Ore. Therma-Flo -Circulating Heaters.
- ity Fan Corp., Los Angeles, Calif.
- hermalfuel—Furnaces. Beck Engineering Combustion Kompany, St. Thermalfuel-
- Thermascrete No. 20 Refractories. Munn and Steele, Inc., Newark, N. J.
- hermidaire—Air Conditioning Units, Blowers, Coils, Furnaces, Louvres & Shutters. E. K. Campbell Heating Co., Kansas City, Mo. Thermidaire
- Filters. Prat-Daniel Corporation, Port Chester, N. Y.
- -Furnaces. American Furnace Co., St. Louis, Mo.
- Thermo-Gas Soldering Furnace. Ward Machinery Co., Chicago, Ill.
- Thermo-Draulie Controls, Damper Motors and Regulators. Perfex Corporation, Milwaukee, Wis.
- Thermo-Drip Humidifier. Automatic Humidifier Co., Cedar Falls, Ia.
- Thermo-Flex Registers. Mfg. & Sales Co., Minneapolis, Minn.
- hermogas—Furnaces. Beck Engineer-ing Combustion Kompany, St. Louis Thermogas
- Thermogrip—Soldering Coppers. Ideal Commutator Dresser Co., Sycamore, III.
- Thermohn-Psychrometers Le Northrup Co., Philadelphia, Pa.
- Thermohumidigraph Humidity Re corders. Bristol Co., Waterbury,
- Thermoll-Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.
- Thermopane-Windows, Libbey-Owens-Ford Glass Co., Toledo, O.
- -Plastic Fire Brick. Thermopastecago Fire Brick Co., Chicago, Ill.
- hermopilot-Controls. Ger trols Co., Glendale, Calif. Thermopilot-General Con-
- Thermotite-Insulation. Coast Insulating Corp., Los Angeles, Calif.

- Thin-Man-Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Ther-Spray Paint Guns. Binks Mfg. Co., Chicago, Ill.
- Electric Buffers, Nibblers and Independent Pneumatic Tool Co., Chicago, Ill.
- Thor Drill Champion -- Electric Drills. Independent Pneumatic Tool Co.,
- 3000-Refractories. Refractory & Insulation Corporation, New York, N. Y.
- 370 Special-Paints. Thompson & Co., Pittsburgh, Pa.
- Threplex—Flashing. Chase Brass & Copper Co., Incorporated, Waterbury,
- -Time Switches. Tork Clock Co., Thrift-Inc., Mt. Vernon, N. Y.
- Throway-Steel Wool Filters. American Air Filter Co., Inc., Louisville, Ky.
- Tik Wheat-Pipe Covering Paste. Clark Stek-O Corp., Rochester, N. Y.
- Tillery's Furnace Clock. Little Janitor Furnace Clock Co., New York,
- Timercoid-Time Clock. Mercoid Corp., Chicago, Ill.
- Timerelay Relays. Minneapolis-Hon-eywell Regulator Co., Minneapolis,
- -Damper Quadrants. Goese Time-Saver-Mfg. Co., Milwaukee, Wis.
- Timetrol-Switches. Penn Electric Switch Co., Goshen, Ind.
- Tin Loy-Tinning Compounds.
 Picher Lead Co., Cincinnati, O. Eagle-
- Tinol—Compounds and Soldering Flux. American Solder & Flux Co., Philadelphia, Pa.
- -Caulking Compounds, J. H. Krehbiel Co., Chicago, Ill.
- Titelock-Fittings and Accessories for Conductor, Eaves Trough and Gutter, Furnace Pipe, Copper Roofing. Mil-cor Steel Co., Milwaukee, Wis.
- iteSeal—Caulking Compounds. Radia tor Specialty Co., Charlotte, N. C.
- Tobin Bronze-Plates and Welding American Brass Co., Water bury, Conn.
- Tocol 900-Roofing Paint. Protective Coatings, Incorporated, Detroit, Coatings, Mich.
- Tomb Brand--Insulation. Barrett Div., Allied Chemical & Die Corp., New
- Toncanare-Electrodes. Universal Power Corporation, Cleveland, O.
- Tonean Iron-Roofing, Sheets. Republic Steel Corp., Cleveland, O.
- Toolweld-Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Top-Notch Furnaces. Excelsior Steel Furnace Co., Chicago, Ill. Toridaire-Furnaces. Fraser and John-
- ston Co., San Francisco, Calif. Torid-Cast - Refractories. Walsh Re-
- fractories Corp., St. Louis, Mo. ornado — Furnace Vacuum Cleaners. Breuer Electric Mfg. Co., Chicago, Tornado -
- -Soldering Furnaces and es. Geo. W. Diener Mfg. Co., Torrid -Torches. Ge Chicago, Ill. Geo.
- Torridheet Blower-Filters, Burners, Furnaces and Heaters. Cleveland Steel Products Corp., Cleveland.

- -Furnaces. Torrid Zone-Lennox Furnace Co., Marshalltown, Ia.
- Ventilators. A-J Mfg. Co., Kansas City, Mo.
- Transite—Duct Board, Pipe and Fit-tings. Johns-Manville, New York, tings. N. Y.
- Transparent-Air Filter Gauge Dwyer Mfg. Co., Chicago, Ill.
- ransweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Tri-Flux-Soldering Flux. Wolfe-Kote Co., Sheboygan, Wis.
- Trimtherm-Thermostats. General Controls Co., Glendale, Calif.
- riple A-Paints, Enamels and Lacquers. Quigley Co., Inc., New York, Triple A-
- Triple Drain—Channel Roofing. lic Steel Corp., Cleveland, O. -Channel Roofing. Repub-
- riple Lock—Roofing Nails. The Deniston Co., Chicago, Ill. Triple Lock-
- Triple-Mix --Furnace Cement. J. H. Krehbiel Co., Chicago, Ill.
- -Furnaces. Home Furnace Co.. Holland, Mich.
- Tripl-ife-Furnaces. Williamson Heater Co., Cincinnati, O.
- Tripitrol-Controls. White Mfg. Co.,
- St. Paul. Minn.
- Triumph—Furnaces. Joseph Capps, Inc., South Gate, Calif.
- -Furnaces and Stokers, Auburn Burner Co., Auburn, Ind.
- -Ventilators. Danzer Metal Works Co., Hagerstown, Md.
- ropic Breeze—Furnaces. Dalzen Man-ufacturing Co., Detroit, Mich. Tropic Breeze-
- Thermostatic Bi-Metals. Gen-Truflexeral Plate Div. Metal Corp., Attleboro, Mass. Metals & Controls
- Tuffernell-Paint. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Trussteel—Registers. United Sta Register Co., Battle Creek, Mich.
- -Plastic Tubing. Extruded Plastics, Inc., Norwalk, Conn.
- Turbo—Air Washers. Bayley Blower Company, Milwaukee, Wis.
- Turbo-Lift-Pumps. urbo-Lift-Pumps. American - Ma Pumps, Inc., Battle Creek, Mich. - Marsh
- Turbovane-Blowers. B. F. Sturtevant Co., Boston, Mass.
- Turret Water Circulating P. Yeomans Bros. Co., Chicago, Ill. Pumps,
- 20th Century-Bearings. Roller Bearing Co. of America, Trenton, N. J.
- Twin Contact-Controls. Relays. mostats. Perfex Corporation, Milwaukee, Wis.
- Twin Control-Oil Burners. H. J. Hueller Mfg. Co., Inc., Brooklyn, N. Y.
- Twin-Fyre-Oil Burner. Aldrich Co., Wyoming, Ill.
- Tygon-Metal Protecting Paint. U. S. Stoneware Co., Akron, Ohio.
- Tyl-Lyke-Steel Roofing and Siding. Continental Steel Corp., Kokomo, Ind.
- Type X Stainless Cleaner. Tu Products, Inc., Los Angeles, Calif. Turco
- Tytecote Reflective Blanket Insula-tion. Specialty Converters, Inc., East Braintree, Mass.

UAC — Air Conditioners. Burnham Boiler Corp., Irvington, N. J.

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- U-In-Tah Paint. American-Marietta Co., Chicago, Ill.
- U.S.—Pipe Fittings, Grilles, and Registers. United States Register Co., Battle Creek, Mich.
- USG—Built-Up Roofing and Roof Ce-ment and Paint. United States Gyp-sum Co., Chicago, Ill.
- U.S.S. Nails, Roofing, Sheets, Plates, Wire. Subsidiaries, U. S. Steel Corporation
- U.S.S. American—Nails. American Steel & Wire Co., Cleveland, O.
- U.S.S. Carilloy Alloy Plates. Car-negie-Illinois Steel Corp., Pittsburgh,
- S. S. Columbia Roofing, Sheets. Columbia Steel Co., San Francisco,
- .s.s. Paintbond Sheets. Carnegle-Illinois Steel Corporation, Pittsburgh,
- U.S.S. Stormseal Steel Roofing. Car-negle-Illinois Steel Corp., Pittsburgh,
- U.S.S. Tennescal Roofing. Tennessee Coal, Iron & Railroad Co., Birming-ham, Ala.
- U.S.S. Vitrenamel Sheets. Carnegie-Illinois Steel Corporation, Pittsburgh,
- Uction Coatings and Paint. United Chromium, Incorporated, New York City.
- Sheets. Republic Steel Corp., U-Loy Cleveland, O.
- MCO—Furnaces. Union Manufacturing Co., Boyertown, Pa.
- Unamatic -Automatic Shielded Arc Welding. Una Welding, Inc., Cleve-land, O.
- Unicool Air Conditioning Units and Washers. Betz Engineering Co., Kansas City, Mo.
- Uniduct-Prefabricated Ducts. General Heating Products Co., Minneapolis, Minn.
- Unifil-Insulation. Robinson Insulation Co., Great Falls, Mont.
- Uni-Fin-Grilles and Warm Air Registers. Barber-Colman Co., Rockford,
- niflex-Roofing Paint. Acorn Refining Co., Cleveland, O.
- ni-fio Duct Turning Vanes, Grilles and Registers. Barber-Colman Com-pany, Rockford, Ill.
- niloy-Stainless Steel Sheets. Univer-sal-Cyclops Steel Corp., Bridgeville, Unilov-
- Unipack—Blowers. American Machine Products Co., Marshalltown, Iowa.
- Unique—Air Conditioning Furnace. Ex-celsior Steel Furnace Co., Chicago, Ill.
- Unishear Portable Electric Shears. Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
- Unisorb—Bases and Pads and Duct Insulation. Felters Co., Inc., Boston, Mass
- Unitaire Air Conditioning Units for Stores. Westinghouse Electric & Mfg. Co., East Springfield, Mass.

- Uni-Therm—Air Cond. Furnace. Utility Fan Corp., Los Angeles, Calif.
- Air Filters. Hugo Mfg. Co., Duluth, Minn.
- Universal Angle Benders. Hossfeld Mfg. Co., Winona, Minn.
- Universal—Bases. Vibration Engineer-ing Company, New York City.
- Universal-Dial Damper. Parker-Kalon Corp., New York, N. Y.
- Unxld Damper Quadrants. Parker-Kalon Corp., New York, N. Y.
 Upson—Rivets, Bolts. Republic Steel
- Corp., Cleveland, O.
- Blowers and Blower-Filter Units, Fans, Grilles, Washers and Blower Wheels. U. S. Air Conditioning Corp., Minneapolis.
- Utilus—Kitchen Exhaust and Ventilat-ing Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.

- V-Vent Ventilators. Aeolus Dickin-son, Chicago, Ill.
- Vacu-Draft—Forced Draft Blowers. Muncie Gear Works, Inc., Muncie, Ind.
- alcalex Damper Regulators. Young Regulator Co., Cleveland, O.
- aldura—Caulking Compounds, Paint. American-Marietta Co., Chicago, Ill.
- Valley Forge—Cement. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Vapoglas Humidifier Evaporating Plates. Skuttle Mfg. Co., Detroit, Mich.
- Vaporator-Humidifiers. Rudy Furnace Co., Dowagiac, Mich.
- edoc Enamels. Ferro Enamel Corp., Cleveland, O.
- eelos Adjustable V-Belts. Manheim Mfg. & Belting Co., Manheim, Pa.
- Anemometers. Illinois Tes ing Laboratories, Inc., Chicago, Ill.
- enetian Cement Paint. E. D. Cod-dington Mfg. Co., Milwaukee, Wis.
- Venetian—Roofing Paint. Clinton Metal-lic Paint Co., Clinton, N. Y.
- Ventura—Fans, Ventilators. American Blower Corp., Detroit, Mich.
- Venturi-Fle Air Diffusers, Ceiling Ventilators, Duct Turning Vanes. Barber-Colman Company, Rockford,
- Veri-Best Soldering Furnaces and Torches. Van Praag Sales, New York
- Vernois Furnaces and Heaters. Mt. Vernon Furnace & Mfg. Co., Mt. Ver-non, Ill.
- Versa-Tool Portable Electric Drill. York Electric and Machine Co., York,
- Vertivent-Ventilators. Young Radia-tor Co., Racine, Wis.
- Vibracork-Bases. Armstrong Cork Co., Lancaster, Pa.
- ibro-Bars—Vibration Isolating Bases. Korfund Co., Inc., Long Island City.
- bro-Dampers Vibration Isolating Bases. Korfund Co., Inc., Long Island City.
- Vibre-Iselater—Vibration Iselating Bases. Korfund Co., Inc., Long Island

- Victor—Blower-Filter Units, Furnaces, Humidifiers, Oil Burners, Stokers, Hall-Neal Furnace Co., Indianapolis,
- Victoraire Winter Air Conditioners. Hall-Neal Furnace Co., Indianapolis,
- Victorgas—Gas Units. Hall-Neal Fur-nace Co., Indianapolis, Ind.
- ictoria Venetian Blinds. Bostwick-Goodell Co., Norwalk, Ohio.
- letereil Air Conditioning Furnaces. Hall-Neal Furnace Co., Indianapolis,
- Victorstoke Stoker Units. Hall-Neal Furnace Co., Indianapolis, Ind.
- Victory-Oil Burners. Caloroll Burner Corp., Hartford, Conn.
- Victory-Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Vigoraire—Furnaces. Marshall Furnace Co., Marshall, Mich.
- Visaflame—Oil Burner Controls. Mer-cold Corp., Chicago, Ill.
- Vitalaire Portable Room Cooler. Ice Cooling Appliance Corp., Morrison,
- Vitra-Carlite Enamels and Lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
- Vitriset—Furnace Cement. U. S. Stone-ware Co., Akron, Ohio.
- Vitroliner Vent and Flue Pipe and Fittings. Condensation Engineering Corp., Chicago, Ill.
- Volcane Chimney Caps and Tops, Ven-tilators. Iwan Brothers, South Bend,
- Volocitrol Stack-Head Damper. Barber-Colman Co., Rockford, Ill.
- ortex-Furnace Vacuum Cleaners. B. F. Sturtevant Co., Hyde Park, Boston, Mass.
- Vertex-Spray Nozzles. Phillips Cooling Tower Co., Inc., New York City.
- ulcan—Stokers. Susquehanna Engi-neering Co., Bloomsburg, Pa.
- Vulcanite Roofing, and Roofing Ce-ment. Certain-teed Products Corp., New York City.
- Vulcatex—Caulking and Glazing Com-pounds. A. C. Horn Co., Long Island City, N. Y.
- Vulce—V-type Belts and Pulleys. Gates Rubber Co., Denver, Colo.
- Vulce Etch—Welding Compounds. Tur-co Products, Inc., Los Angeles, Calif.

- WAW-Tools. W. A. Whitney Mfg. Co., Rockford, Ill.
- HS-Couplings, Pulleys. Winfield H. Smith, Inc., Springville, N. Y.
- W. O. No. 1—Rust Preventive Chemicals. Turco Products, Inc., Los Angeles, Calif.
- Varce Refractories. Walsh Refractories Corp., St. Louis, Mo.
- Ward Zephyr Attic Fans. Edgar T. Ward Co., Inc., River Forest, Ill.
- Warrior-Furnaces. Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Vatre-Spray Nozales. Water Cooling Corp., New York City.
- Vaterbase—Furnaces. Farris Furnace Co., Springfield, Ill.

- Water-Boy Humidifier Valves, Maid-O'-Mist, Inc., Chicago, Ill.
- Waterbury Oil Burners, Cabinets, Casings, Ducts and Fittings, Pipe, Pipe Fittings and Accessories, Furnaces and Heaters. Waterman-Waterbury Co., Minneapolis, Minn.
- Water-RAY-trola Oil-fired Water Heater. Ray Oil Burner Co., San Francisco, Calif.
- Waterseal-Cement. Thompson & Co., Pittsburgh, Pa.
- Watertender-Humidifier Valve. Skuttle Mfg. Co., Detroit, Mich.
- Wearweld Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Wearwell Paint. Thompson & Co., Pittsburgh, Pa.
- Weathercote Waterproofing Compounds. Glidden Co., Cleveland, O.
- Weathermakers Air Conditioning Units. Carrier Corp., Syracuse, N. Y.
- Weather-Seal Roof Cement. Acme White Lead & Color Works, Detroit, Mich.
- Weatherwood Insulation. United States Gypsum Co., Chicago, Ill.
- Webster—Spray Nozzles and Air Washers. W. J. Strandwitz & Co., Inc., Camden, N. J.
- Weco Roof Drains. Wade Manufacturing Co., Elgin, Ill.
- Wedgbelt—Belts and Pulleys. American Pulley Co., Philadelphia, Pa.
- Weir Air Conditioning Furnaces, Gravity Furnaces, Heaters, Humidiflers, Stokers. Meyer Furnace Co., Peoria, Ill.
- Weirceley—Copper Bearing Galvanized Sheets. Weirton Steel Co., Weirton, W. Va.
- Weirte-Tin Plate. Weirton Steel Co., Weirton, W. Va.
- Weisco Skylight Lifts. H. Weiss & Co., New York, N. Y.
- Weld-Craft Welders. Allied Weld-Craft, Inc., Indianapolis, Ind.
- Weldon-Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
- Weld-o-trol—Spot Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Weld-O-Tron-Arc Welders. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- Wellsville Savage—Fire Brick. Chicago Fire Brick Co., Chicago, Ill.
- Wesco Blower Filters. Northwest Stove & Furnace Works, Inc., Portland, Ore.
- Wesce Diamond—Furnaces. Northwest Stove & Furnace Works, Portland, Ore.
- Wesee Duplex—Utility Room Furnaces. Northwest Stove & Furnace Works, Portland, Ore.
- Wesco Hiboy Furnaces. Northwest Stove & Furnace Works, Inc., Portland, Ore.
- Wesco Furnaces. John Westwick & Son, Inc., Galena, Ill.
- Wesco-Furnaces. Woods-Evertz Stove Co., Springfield, Mo.
- West Wind-Window Fans. American Metal Products Co., Fort Worth, Tex.

- Western Fan Roof Fan Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
- Western King-Furnaces. Independence Stove & Furnace Co., Independence, Mo.
- Western Turbine—Gravity Roof Ventilators. Western Engineering & Mfg. Co., Los Angeles, Calif.
- Westernaire Exhausters Ventilating Fans. Western Engineering & Mfg. Co., Los Angeles, Calif.
- Whirlator—Oil Burners. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Whirleone Spray Nozzles. Water Cooling Equipment Corp., St. Louis, Mo.
- Whirljet Spray Nozzles. Spraying Systems Co., Chicago, Ill.
- Whiting Stokers. Eddy Stoker Corporation, Chicago, Ill.
- Whitney-JENSEN Angle Benders, Brakes, Elbow and Pittsburgh Lock Forming Machines, Punches, Shears and Tools. Whitney Metal Tool Co., Rockford, Ill.
- Whiz-Electric Drills. Paramount Products Co., New York City.
- Wiechert-Furnaces, Heaters. St. Clair Foundry Corp., Centralia, Ill.
- Wilhelm Furnace Cement. Glidden Co., Cleveland, O.
- Wilson Arc Welders. Air Reduction Sales Company, New York City.
- Wilson Furnace Brushes. Worcester Brush & Scraper Co., Worcester, Mass.
- Winair Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.
- Wineo—Harold W. Winningham & Company, Seattle.
- Wind Electric—Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
- Wind-O-Fan, Jr.—Window Ventilating Fan. Chelsea Fan & Blower Co., Inc., Irvington, N. J.
- Wind-O-Vane Jr.—Kitchen Exhaust Fans. B. F. Sturtevant Co., Hyde Park, Mass.
- Wind-O-Vent-Ventilator Units, Reed Unit-Fans, Inc., New Orleans, La.
- Windowstat—Condensation Control. Friez Instrument Div., Towson, Md.
- Winkler-Fans and Stokers. U. S. Machine Corporation, Lebanon, Ind.
- Winner-Gravity Registers. Auer Register Co., Cleveland, O.
- Winter-Chaser Air Conditioning Units, Furnaces, Heaters. Campbell Heating Co., Des Moines, Ia.
- Winter King Furnaces. McPherson Furnace & Supply Co., Portland, Ore.
- Wire-Klad Filters. Dollinger Corporation, Rochester, N. Y.
- Wissco-Grilles and Gas Welding Rod. Wire Cloth. Wickwire Spencer Steel Co., New York City.
- Wizard Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.
- Wolfe—Angle Meter, Circle Meter, Divizor, Protractor. Interstate Sales Co., New York City.
- Wolverine—Fans, Blades, Exhausters. Belanger Fan & Blower Co., Detroit, Mich.
- Wolverine Furnaces. Marshall Furnace Co., Marshall, Mich.
- Woolfelt—Duct Insulation, Norristown Magnesia & Asbestos Co., Norristown, Pa.

Y

- XL Metal Windows. Herrmann & Grace Co., Brooklyn, N. Y.
- X-L-All Coils, Furnaces. Deshler Feundry & Machine Works, Deshler, Ohio.
- Xit-Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
- X-Pandoseal—Transparent Waterproofing. X-Pando Corp., Long Island City.

Y

- Yager's Flux. Alex R. Benson Co., Inc., Hudson, N. Y.
- Yankee Damper Clips and Tips. Howes-Woods Company, Cambridge, Mass.
- Yankee Damper Regulators. Ohio Products Co., Cleveland, O.
- YarWay—Nozzles. Yarnall-Waring Co., Philadelphia, Pa.
- Yearound Air Conditioning Units. Conditionaire Unit Co., Chicago, Ifl.
- Yorkaire Conditioners-Air Conditioning Units. York Corp., York, Pa.
- Yorkaire Heat-Furnaces. York Corp., York, Pa.
- YouBert Collectors and Blow Pipe Fittings. Young & Bertke Co., Cincinnati, O.

Z

- ZTO Chromate—Metal Protecting Paint. New Jersey Zinc Co., New York City.
- Zeph-Air-Gas Furnace. XXth Century Heating & Ventilating Co., Akron, O.
- Zephaire Air Conditioning Units, Window Fans. American Metal Products Co., Fort Worth, Tex.
- Zeph-O-Cone—Diffusers. Waterloo Register Co., Waterloo, Ia.
- Zeph-Oil-Ator Air Conditioning Furnaces. Century Engineering Corp., Cedar Rapids, Ia.
- Zephyr—A. C. Stoker Furnace. Premier Furnace Co., Dowagiac, Mich.
- Zephyr Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
- Zephryplane Sander. Skilsaw, Inc., Chicago, Ill.
- Zero—Furnace and Insulating Cement and Refractories. Standard Fuel Engineering Co., Detroit, Mich.
- Zilloy-Zinc Roofing. New Jersey Zinc Co., New York City.
- Zim-Filters. R. F. Zimmerman, Cincinnati, Ohio.
- Zinc Chromate Primer—Metal Protecting Paint. Hilo Varnish Corp., Brooklyn, N. Y.
- Zinegrip—Steel Sheets. American Rolling Mill Co., Middletown, O.
- Zincoat—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Zoneair—Furnaces. Payne Furnace & Supply Co., Inc., Beverly Hills, Calif.
- Zonolite Cement Combustion Chambers, Insulation and Refractories. Universal Zonolite Insulation Co., Chicago, and Munn and Steel, Inc. Newark, N. J.
- Zonolite-Insulation, Robinson Insulation Co., Great Falls, Mont.
- Z-Re King-Furnaces. Oakland Foundry Co., Belleville, Ill.
- Zura Roofing Paint. L. Sonneborn Sons, Inc., New York City.

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• Accurate Mfg. Works, 2336-38 Milwaukee Ave., Chicago.

• Accurate Metal Weather Strip Co., 216 E. 26th St., New York

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Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago.

Advance Appliance Co., Inc., 808-810 S. Washington St., Peoria, Ill.

Advance Electric Co., 1260 W. 2nd, St., Los Angeles.
Advance Fan & Blower Co., 3428 Bagley, Detroit.
Advance Insulating Co., 714 Magee Bldg., Pittsburgh.
Acolus Dickinson, 3320 S. Artesian Ave., Chicago 8.
Aerofin Corp., 410 S. Geddes St., Syracuse, N. Y.
Aeroll Burner Co., Inc., Park Ave. at 57th St., West New York,

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Aerovent Fan Co., 710 E. Ash St., Piqua, O.
Agnew Electric Co., Milford, Mich.
Agricola Furnace Co., Inc., North 12th St., Gadsden, Ala.
Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32.
Air Conditioning Equip. Co., P. O. Box 1123, Minneapolis 1.
Air Conditioning Products Co., 1230 Eighteenth St., Detroit 16.
Air Conditioning and Refrigeration Div., Worthington Pump &
Machinery Corp., Harrison, N. J.
Air Conditioning & Stokers, Inc., 1610 Tower Grove Ave., St.
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Louis.

Air Control Products, Inc., Coopersville, Mich.

Air Controls, Inc., 2310 E. Superior Ave., Cleveland 14.

Air Devices, Inc., 17 E. 42nd St., New York City.

Airecon Industries Incorporated, 2536 Fourteenth St., Detroit 16.

Air Fliter Engineering Co., 2446 S. Parkway, Chicago.

Aire-Folle Fan & Blower Co., 4737 W. Vernor Highway, Detroit.

Airgard Manufacturing Co., 609 N. La Salle St., Chicago.

Airmaster Corp., 4317 Ravenswood Ave., Chicago.

Air-Maze Corp., 5290 Harvard Ave., Cleveland 5.

Air-O-Cell Industries, Inc., 11616 Cloverdale Ave., Detroit.

Airo-Fin Grille Co., 19159 John R. St., Detroit.

Airo-Fin Grille Co., 19159 John R. St., Detroit.

Air Reduction Sales Co., 60 E. 42nd St., New York City 17.

Air & Refrigeration Corp., 476 Fifth Ave., New York City 17.

Air Stream Filter Corp., 2100 Washington Ave., St. Louis 3.

Airtemp Div. Chrysler Corp., 1119 Leo St., Dayton 1, Ohio.

Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10.

Alrwasher Corporation, 1122 N. Washington Ave., Lansing,

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Ajax Building Bracket Co., 1551 Rydal-Mount Rd., Cleveland Heights, O.

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• Allen Co., Inc., L. B., 6702 Bryn Mawr Ave., Chicago 31.

• Allen Corp., 9752 Erwin, Detroit 13.

Allied Heating & Air Conditioning Co., 14807 Condon Ave., Lawndale, Calif.

Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 4.

Allington & Curtis Mfg. Co., 1500 Holland Ave., Saginaw, Mich. Allis-Chalmers Manufacturing Company, Milwaukee 1.

Allis Co., Louis, 427 Stewart St., Milwaukee.

Allmetal Weatherstrip Co., 229 W. Illinois St., Chicago.

Allred Manufacturing Company, Inc., 2154 N. Sherman Dr., Indianapolis.

Indianapolis. All States Roofers Equipment & Material Co., 2107 W. Lake

All States Roofers Equipment & Material Co., 2107 W. Lake St., Chicago.

Alpha Metal & Rolling Mills, Inc., 363 Hudson Ave., Brooklyn 1.

Alphil Spot Welding Co., 431 W. Broadway, New York City.

Alton Mineral Wool Insulation Co., P. O. Box 268, Alton, Ill.

Aluminum Co. of America, 801 Gulf Bidg., Pittsburgh 19.

Aluminum Goods Mfg. Co., Manitowoc, Wis.

American Agile Corporation, 5806 Hough Ave., Cleveland 3.

American Air Conditioning Co., 2831 Thirteenth Ave., Min-

neapolis.

American Air Conditioning Co., Boulevard Bldg., Detroit. American Air Conditioning Corp., P. O. Box 29, Sebastopol,

American Air Filter Co., Inc., 113 Central Ave., Louisville 8, Ky. American Blower Corp., Box 58, Roosevelt Park Annex, Detroit. American Brass Co., 414 Meadow St., Waterbury 88, Conn. American Cabinet Hardware Corp., Rockford, Ill. American Chain Division, American Chain & Cable Co., Inc., York Pe

American Chain Division, American Chain & Cable Co., Inc., York, Pa.
American Chemical Paint Co., Brookside Ave., Ambler, Pa.
American Coal Burner Co., 18 E. Erie St., Chicago 11.
American Colis, Inc., 25-27 Lexington St., Newark, N. J.
American Coolair Corp., 3604 Mayflower St., Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City, Mo.
American Emblem Co., Inc., P. O. Box 116M, Utica 1, N. Y.
American Excelsior Corp., 100-20 N. Halsted St., Chicago.
American Flange & Mfg. Co., Inc., 1901 RCA Bidg., Radio City,
New York City 10.
American Flexible Coupling Co., 1801 Pittsburgh Ave., Erie, Pa.
American Foundry Equipment Co., 621 Byrkit St., Mishawka,
Ind.

Ind. American Foundry & Furnace Co., Washington at McClun St.,

American Foundry & Furnace Co., Washington at McClun St., Bloomington, Ill.

American Furnace Co., 2719-31 Delmar Bivd., St. Louis.

American Furnace & Foundry Co., Drawer E, Milan, Mich.

American Gas Furnace Co., 140 Spring St., Elizabeth, N. J.

American Hair & Felt Co., 222 N. Bank Dr., Chicago 54.

American Instrument Co., 8010 Georgia Ave., Sliver Spring, Md.

American Insulator Corp., New Freedom, Pa.

American-Larson Ventilating Co., 1004 Keystone Bank Bldg.,

Ditteburgh Pa.

Pittsburgh, Pa. American Machine Products Co., 207-11 Market St., Marshall-

American-Marietta Company, 43 E. Ohio St., Chicago 11. American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.

American Metal Hose Branch, American Brass Co., 67 Jewelry St., Waterbury, Conn. American Metal Products Co., 730 Hudgins St., Fort Worth 9,

Tex. American Metal Weather Strip Co., 114 N. Division Ave., Grand

Rapids 2, Mich.
American Moistening Co., 260 W. Exchange St., Providence, R. I.
American Nickeloid Co., 1505 Second St., Peru, Ill.
American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29.
American Radiator & Standard Sanitary Corp., P. O. Box 1226,

Pittsburgh 22

Pittsburgh 22.

American Rolling Mill Co., 703 Curtis St., Middletown, O. American Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., 11 Elias St., Bridgeport 2, Conn. American Screw Co., 21 Stevens St., Providence, R. I. American Sheet Metal Works, 331 N. Alexander, New Orleans.

American Suleting & Refining Co., 120 Broadway, New York 5. American Solder & Flux Co., 2152 East Norris St., Philadelphia. American Steel Band Co., Box 565, Pittsburgh 30.

Chicago.

American Steel & Wire Co., 614 Superior Ave., N. W., Cleve-American Stove Co., Lorain Div., 1200 Long Ave., Lorain, O. American Warming & Ven. Co., 1017 Summit St., Toledo 4. American Zinc Products Co., Greencastle, Ind. Ames Co., W. R., 150 Hooper St., San Francisco 7. Amirton Co., 149 Broadway, New York City 6. Anchor Post Fence Co., Heating Div., Eastern Ave. & Kane St., Baltimore 24 Md. Baltimore 24, Md. Anchor Stove & Range Co., Div. Stratton & Terstegge Co., Third Anchor Stove & Hange Co., Div. Stratton & Terstegge Co., Third & Culbertson, New Albany, Ind.
Andersen Corp., Bayport, Minn.
Andersen Mfg. Co., 511 3rd, Des Moines, Ia.
Andes Range & Furnace Corp., 117 Evans St., Geneva, N. Y.
Andrews Heating Co., 117-199 Main St., S. E., Minneapolis.
Andrews Lead Co., Inc., 30-48 Greenpoint Ave., Long Island City, N. Y.

Anemostat Corp. of America, 10 E. 39th St., New York City 16.

Angell Nail & Chaplet Co., 4580 E. 71st St., Cleveland, O.

Angier Corp., Framingham, Mass. Anti-Corrosive Metal Products Co., Inc., P. O. Box 788, Albany,

Antigo Building Supply Co., Antigo, Wis. Apfel & Co., 928 S. Ninth St., Hamilton, O. Apollo Metal Works, 66th Pl. & S. Oak Park Ave., Clearing Sta., Chicago

Chicago.

Apollo Steel Co., 609-617 Warren Ave., Apollo, Pa.

April Showers Co., 4126 Eighth St., N. W., Washington 11.

Aqua-Mist Co., 426 Jefferson St., Topeka, Kan.

Arcos Corp., 401 N. Broad St., Philadelphia 8.

Arcweld Mfg. Co., Inc., 3469 Third Ave. W., Seattle 99, Wash.

Arex Co., 333 N. Michigan Ave., Chicago.

Armstrong-Blum Mfg. Co., 5700 Bloomingdale Rd., Cragin Sta.,

Chicago.

Armstrong Co., 241 S. Post St., Detroit 17.
Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., 1649 Olentangy River Rd., Columbus, O.
Arrow-Hart & Hegeman Elect. Co., 103 Hawthorn St., Hartford 6. Conn.

Arrow-Hart & Hegeman Elect. Co., 103 Hawthorn St., Hartford 6, Conn.

Asphalt Products Co., Inc., Eastwood Sta., Syracuse, N. Y. Associated Heater Parts Co., 2807 S. LaSalle St., Chicago.

Associated Southern Industries, 1161 Union Ave., Memphis, Tenn. Atcheson Glass Co., T. J., 955 Main St., Buffalo, N. Y. Athey Co., 6035 W. 65th St., Chicago.

Atkins & Co., E. C., 402 S. Illinois St., Indianapolis 9, Ind. Atlantic Metal Hose Co., Inc., 123 W. 64th St., New York City. Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.

Atlas Bolt & Screw Co., 1130 Ivanhoe Rd., Cleveland, O. Atlas Heating & Ventilating Co., Ltd., 557 4th St., San Francisco. Atlas Machine & Tool Co., 115 N. Going St., Portland 11, Ore. Atlas Valve Co., 282 South St., Newark, N. J.

Atlas Welding Accessories Co., 14820 Wyoming Ave., Detroit 21. Auburn Burner Co., Lock Box 269, Auburn, Ind. Audubon Wire Cloth Corp., Allen St. & Castor Ave., Philadelphia. Auer Register Co., 3608 Payne Ave., Cleveland 14.

Au-Temp-Co Corp., 521 Fifth Ave., New York City 17.

Autoforce Ventilating System, 244 Washington St., Boston 8.

Autogas Co., 2258 Diversey Ave., Chicago.

Auto-Heat Corp., 311 W. 66th St., New York City.

Automatic Burner Corp., 1823 Carroll Ave., Chicago 12, Ill.

Automatic Gasflux Mfg. Co., 198 Wayne St., Mansfield, O.

Automatic Products Co., 2450 N. 32nd St., Milwaukee 10, Wis.

Automatic Pump & Softener Corp., Rockford, Ill.

Automatic Switch Co., 41 E. 11th St., New York City 3.

Automatic Temperature Control Co., Inc., 44 E. Logan St., Philadelphia 44.

Automatic Ventilator Co., 503 S. Shiawasse, Corunna, Mich.

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B

B/W Controller Corp., 2200 E. Maple Ave., Birmingham, Mich. Babcock & Wilcox Co., 85 Liberty St., New York City 6. Bacharach Industrial Instrument Co., 7000 Bennett St., Pitts-Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh, Pa.
Bache & Co., Semon, Greenwich & Morton Sts., New York 14.
Badger Mfg. Co., 106 N. Frances St., Madison, Wis.
Badger Mfg. & Sales Co., 327 E. Brown St., Milwaukee 12, Wis.
Baer Brothers, 438 W. 37th St., New York City.
Bahnson Co., 1001 S. Marshall St., Winston-Salem, N. C.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Furnace & Cleaner Mfg. Co., 2152 Smead Ave., Toledo, O.
Baker Ice Machine Co., Inc., 1509 Evans St., Omaha, Nebr.
Baldor Electric Co., 4358 Duncan Ave., St. Louis, Mo.
Baldwin-Hill Co., 527 Klagg Ave., Trenton 2, N. J.
Ballantyne Co., 222 N. 16th St., Omaha 2, Nebr.
Balloffett Dies & Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.

Banner Repair Parts Co., 103 E. Indianola Ave., Youngstown, O.

Banner Repair Parts Co., 103 E. Indianola Ave., Youngstown, O. Bantam Bearings Div., Torrington Co., South Bend 21, Ind. Barber Asphalt Corp., Barber, N. J. Barber Co., Inc., 1600 Arch St., Philadelphia. Barber-Colman Co., River & Loomis Sts., Rockford, Ill. Barber Gas Burner Co., 3704 Superior Ave., Cleveland 14. Barclay, Inc., Robt., 128 N. Peoria St., Chicago, Ill. Bard Mfg. Co., Evansport Road, Bryan, O. Bardes Range & Foundry Co., E. H., 2619 Colerain Ave., Cincolmant Col., 2012 Barium Stainless Steel Corp., 1502 Allen Ave., S. E., Canton, O.

Barland Weatherstrip Material Co., 1960 E. 59th St., Cleveland 3, O. Barnes Metal Products Co., 4425 W. 16th St., Chicago. Barnes, W. O., 1297 Terminal Ave., Detroit 14.
Barrett Division, Allied Chemical & Die Corp., 40 Rector St..
New York City 6.
Barrett Engineers, 1322 Warrensville Center Rd., Cleveland Heights, O.

Barry Furnace Co., 208 N. B St., Hamilton, O. Barth Manufacturing Co., Plantsville, Conn. Bartlett Hayward Co., 200 Scott St., Baltimore. Bartlett Hayward Co., 200 Scott St., Baltimore.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit.
Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago 30.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bath Co., Cyril, E. 70th & Machinery Ave., Cleveland.
Bayer Co., A. J., Slauson & Santa Fe Aves., Los Angeles.
Bayley Blower Co., 1817 S. 66th St., Milwaukee.
Beacon-Morris Corp., 110-114 Brookline Ave., Boston 15.
Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport 5, Conn.

Bear Mfg. Co., Industrial Div., 2030 Fifth Ave., Rock Island, Iil. Bearing Co. of America, Lancaster, Pa. Beatrice Steel Tank Mfg. Co., 700 S. 7th St., Beatrice, Nebr. Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind. Beck Engineering Combustion Kompany, 3033 Spruce St., St. Louis

Louis.

Beckett Engineering Co., R. W., W. River St., Elyria, O. Beckley Perforating Co., 305 North Ave., Garwood, N. J. Belanger Fan & Blower Co., 1230 18th St., Detroit 16. Belco Exhaust Fan Mfg. Co., 3830-32 Olive St., St. Louis. Belden Machine Co., 1108 Whalley Ave., New Haven, Conn. Beifield Co., H., 435 N. Broad st., Philadelphia 23. Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill. Belmont Smelting & Refining Works, Inc., 231 Georgia Ave., Brooklyn, N. Y. Brooklyn, N. Y.

Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4.
Benjamin Elec. Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.
Berger Bros. Co., 229-237 Arch St., Philadelphia 6.
Berger Mfg. Div. of Republic Steel Corp., 1038 Belden Ave.,
N. E., Canton 5, O. N. E., Canton 5, O.

Bergman Tool Mfg. Co., 1573-75 Niagara St., Buffalo, N. Y.

Bergstrom Mfg. Corp., Neenah, Wis.

Bern's Specialty Mfg. Co., 2278 Elston Ave., Chicago.

Bernz Co., Otto, 280 Lyell Ave., Rochester, N. Y.

Berry, Jr., F. E., & Co., Inc., Spring St., Everett, Mass.

Bersted Co., Martin, 341 N. Crawford Ave., Chicago.

Bertram Mfg. Co., 230 E. Ohio St., Chicago.

Bertram Mfg. Co., 230 E. Ohio St., Chicago.

Best Register Co., 2005 W. Oklahoma Ave., Milwaukee 7.

Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.

Best Register Co., 2005 W. Oklahoma Ave., Milwaukee 7.
Bethlehem Foundry & Machine Co., Brodhead Ave. & Second St., Bethlehem, Pa.

Bethlehem Steel Co., Bethlehem, Pa.
Betz Engineering Co., 1820 Wyandotte St., Kansas City 8.
Betz Corp., 460 State St., Hammond, Ind.
Beverly Shear Co., 3009 W. 110th Pl., Chicago.
Bieler & Son, L., 35-42 41st St., Long Island City, N. Y.
Bien Air Conditioning Co., 1620 N. Spring St., Los Angeles.
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Biggs Supply Co., B. C., Lincoln, Nebr.
Binks Mfg. Co., 3114 Carroll Ave., Chicago 12.
Bird Archer Co., 4337 N. America St., Philadelphia.
Bird & Son, Inc., East Walpole, Mass.
Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14.

Bissell, Fred, 1946 N. 13th St., Toledo 2, O.
Bittner Engineering Co., 18-32 E. 135th St., New York City.

Black & Decker Mfg. Co., 782 Pennsylvania Ave., Towson 4, Md.
Black Servant Stoker Co., 3307 N. Broadway, St. Louis.
Blake & Johnson Co., Waterville, Conn.
Bliss Co., E. W., 1420 Hastings St., Toledo, O.
Blockson & Co., E. Fifth St., Michigan City, Ind.
Blood Brothers Machine Co., Div. Standard Steel Spring Co., Allegan, Mich.

Allegan, Mich.

Allegan, Mich.
Blower Application Co., 918 N. 4th St., Milwaukee 3.
Bluffton Mfg. Co., 433 W. Main Cross St., Findlay, O.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12.
Bogue Electric Co., 37 Kentucky Ave., Paterson, N. J.
Bohn Aluminum & Brass, Michigan Ave. & Shelby St., Detroit.
Bollaert, M., 3936 Rhoda Ave., Oakland, Calif.
Borm Manufacturing Co., Elgin, Ill.
Bossert Co., Inc., 1002 Oswego St., Utica, N. Y.
Boston Gear Wiks., Inc., North Quincy, Mass.
Bostwick-Goodell Co., Norwalk, O.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47. phia 47.

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Bovee Furnace Works, 180 W. Eighth St., Waterloo, Ia.

Boyd & Co., Inc., Chas. P., 250-252 N. Third St., Philadelphia.

Braden Mfg. Co., 431 N. 14th St., Terre Haute, Ind.

Brasco Mfg. Co., 152nd & Commercial Ave., Harvey, Ill.

Brauer Supply Co., A. G., 2100 Washington Ave., St. Louis 3.

Breidert, G. C., Co., 634 S. Spring St., Los Angeles 14.

Bremil Mfg. Co., Box 1030, Erie, Pa.

Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago.

Bridesburg Foundry Co., Tacony & Duncan Sts., Philadelphia.

Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.

Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport.

Conn.

Bridgeport Screw Co., Bridgeport, Conn. Briggs Mfg. Co., 11631 Mack Ave., Detroit. Brigham Oil Burner Co., 3745 Forest Park Blvd., St. Louis.

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AMERICAN ARTISAN, January, 1944

Bristol Co., P. O. Box 1790 Waterbury, 91, Conn. Brooklyn Metal Celling Co., 283-89 Greene Ave., Brooklyn, N. Y. Brooks Co., Inc., B. R., 361 Atlantic Ave., Boston 10. Bros Boller & Mfg. Co., Wm., 1057 Tenth Ave., S. E., Minne-

Brooß Co., Inc., B. R., 351 Aliantic Ave., Boston 10.
Bros Boller & Mfg. Co., Wm., 1057 Tenth Ave., S. E., Minneapolis 14.
Brown-Appton Co., 681 Fifth Ave., New York City.
Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton, O.
Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., 4443 Wayne Ave., Philadelphia.
Brownell Co., 300 N. Findlay St., Dayton, O.
Brownie Stoker Co., 340 N. Morgan St., Decatur, Ill.
Browning Mfg. Co., Inc., Central Ave., Main & Chester Sts., Maysville, Ky.
Brumme Mfg. Co., Bloomington, Ill.
Brundage Co., 500 N. Park St., Kalamazoo 11, Mich.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant Corp., C. L., 4610 St. Clair Ave., Cleveland.
Bryant Heater Co., 17825 St. Clair Ave., Cleveland.
Bubar, Hudson H., 15 Park Row, New York City 7.
Buckeye Portable Tool Co., 25 W. Apple St., Dayton, O.
Burkeye Products Co., 7024 Vine St., Cincinnati, O.
Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.
Buffalo Wire Works Co., 308-332 Terrace, Buffalo.
Burdett Mfg. Co., 19 N. Sheldon St., Chicago.
Burgess-Norton Mfg. Co., 773 Peyton St., Geneva, Ill.
Burgess Soldering Furnace Co., 292 E. Long St., Columbus, O.
Burke Electric Co., 1201 W. 12th St., Erle, Pa.
Burke Stoker & Mfg. Co., 221 W. 19th St., Chicago.
Burnham Boiler Corp., 1 Main St., Irvington, N. Y.
Burnham Stoker Co., 505 Columbia St., Vancouver, Wash.
Burnley Battery & Mfg. Co., (Lay St., North East, Pa.
Burnside Steel Foundry Co., 1300 E. 92nd St., Chicago.
Burnwell Corp., 1113 N. 20th St., Allentown, Pa.
Burt Mfg. Co., 301 Main St., Akron 11, O.
Bush Mfg. Co., 100 Wellington St., Hartford 6, Conn.
Butler Street Fdry. & Iron Co., 3422 Normal Ave., Chicago.
Byers Co., A. M., Clark Bldg., Pittsburgh 22.
Byers Flashing Sales Division, 23 N. Aberdeen, Chicago.

C-B Tool Co., Wabank Road, Lancaster, Pa.
C. & H. Air Conditioning Fan Co., Inc., Edgewood & Ivy Sts., N. E., Atlanta, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9.
Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia, 25.
Caldwell Co., Inc., W. E., 200 E. Brandels, Louisville 8, Ky.
California Wire Cloth Corp., 1001 22nd Ave., Oakland, Calif.
Calkins & Pearce, 203-205 E. Long St., Columbus, O.
Callahan Can Machine Co., Inc., 80 Richards St., Brooklyn.
Caloroli Burner Corp., 1477 Park St., Hartford, Conn.
Campbell, Andrew C., Division of American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport, Conn.
Campbell Engineering Co., 214 W. College Ave., Appleton, Wis.
Campbell Heating Co., P. O. Box 833, Des Moines, Ia.
Campbell Heating Co., P. O. Box 833, Des Moines, Ia.
Campbell Machine Co., 2845 Harriet Ave., Minneapolis.
Canatsey Electric Mfg. Co., 620 Wyandotte, Kansas City, Mo.
Canton Steel Celling Co., 194 Ninth Ave., New York City.
Canton Stoker Corp., 507 Andrews Pl., S. W., Canton I, O.
Canvas Products Co., 1236 S. 7th St., St. Louis.
Capps, Joseph, Inc., 3200 Ardmore St., South Gate, Calif.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York
City 17.
Carrecte. Hilmole Steel Corp., Carpagia Elder, Pittsburgh, 10

City 17.

Carey Co., Philip, Lockland 15, Cincinnati, O.
Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh 19.
Carney Rockwool Co., Mankato, Minn.
Carpenter & Co., Geo. B., 440 N. Wells St., Chicago.
Carpenter Heating & Stoker Co., 1929 E. 55th St., Cleveland.
Carrier Corp., 302 S. Geddeb St., Syracuse, N. Y.
Carter Paint Co., 310 N. Main St., Liberty, Ind.
Cartier & Sons Co., M. N., 275 Canal St., Providence, R. I.
Carty & Moore Eng. Co., 511 W. Larned St., Detroit.
Cary Mfg. Co., Waupaca, Wis.
Catskill Metal Works, Inc., Catskill, N. Y.
Celotex Corp., 120 S. LaSalie St., Chicago 3.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago.
Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis.
Central-West Machinery Co., 335 S. Western Ave., Chicago.
Central Wire & Iron Works, 521 E. Locust St., Des Moines, Ia.
Century Engineering Corp., 401-431 Third St., S. E., Cedar
Rapids, Ia.
Century Engineering Corp., 401-431 Third St., S. E., Cedar
Rapids, Ia.
Century Engineering Corp., 401-431 Third St., New York City.
Certain-teed Products

Century Fan & Vent. Co., 103 E. 125th St., New York City. Certain-teed Products Corp., 100 E. 42nd St., New York City. Certified Flexible Couplings, 369 Lexington Ave., New York

Chare Co., W. M., 1606 Beard Ave., Detroit.
Chain Belt Co., 1618 W. Bruce St., Milwaukee.
Chalmers Oil Burner Co., 318 First Ave., N., Minneapolis.
Chamberlin Metal Weather Strip Co., 1254 La Brosse, Detroit 26.
Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St.,

Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St., Lancaster, Pa.

Champion Furnace Pipe Co., 211-215 Eaton St., Peoria 3, Ill.

Champion Tool Co., 376 W. 41st Pl., Los Angeles 37.

Chandler Co., 804 1st Ave., N. W., Cedar Rapids, Ia.

Char-Gale Mfg. Co., 3127 Hiawatha Ave., Minneapolis 6.

Chase Brass & Copper Co., Inc., 236 Grand St., Waterbury, Conn.

Cheesman-Elliot Co., Inc., 639 Kent Ave., Brooklyn. • Advertisement in this issue. See Index to Advertisers, page 314.

• Chelsea Fan & Blower Co., Inc., 1206 S. Grove St., Irvington.

• Cheney Metal Products Co., 625 Prospect St., Trenton, 5, N. J.

N. J.
Cheney Metal Products Co., 625 Prospect St., Trenton, 5, N. J.
Cherry Rivet Co., 231 Winston St., Los Angeles 13.
Chicago Automatic Stoker Co., Inc., 14 N. Clinton St., Chicago 6.
Chicago Belting Co., 113 N. Green St., Chicago 7.
Chicago Die Casting Co., 2520 W. Monroe St., Chicago 12.
Chicago Expansion Bolt Co., 2240 W. Ogden Ave., Chicago 12.
Chicago Filter Co., P. O. Box 807, Jollet, Ill.
Chicago Firenace Supply Co., 1273 Clybourn Ave., Chicago.
Chicago Furnace Supply Co., 1213 Clybourn Ave., Chicago.
Chicago Metal Hose Corp., 1315 S. Third Ave., Maywood, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32.
Chicago Perforating Co., 2445 W. 24th Pl., Chicago.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Chicago Pump Co., 2330 Wolfram St., Chicago.
Chicago Rawhide Mfg. Co., 1312 Elston Ave., Chicago.
Chicago Rawhide Mfg. Co., 1312 Elston Ave., Chicago.
Chicago Steel Foundry Co., Kedzle & 37th St., Chicago.
Chicago Steel Foundry Co., Kedzle & 37th St., Chicago 17.
Chicago Steel Furnace Co., 7934 S. Chicago Ave., Chicago 9.
Chicago Venetian Blind Co., 2427 W. 14th St., Chicago.
Choate Mfg. Co., 3464 Principlo Ave., Cincinnati.
Cincinnati Elec. Tool Co., 2684 Madison Rd., Cincinnati 8.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati.
Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati.
Cincinnati Shaper Co., 38-34 W. McMicken Ave., Cincinnati.
Cincinnati Stamping Co., 28-34 W. McMicken Ave., Cincinnati.

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Cincinnati Stamping Co., 28-34 W. McMicken Ave., Cincinnati.
Circulators & Devices Mfg. Corp., 100 Prince St., New York City.
Clarage Fan Co., North & Porter Sts., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milidale, Conn.
Clark Co., Henry N., 56-62 Union St., Boston.
Clark Controller Co., 1146 E. 152 St., Cleveland 10.
Clark Dust Control Co., 210 N. Mozart St., Chicago.
Clark Jr., Electric Co., Jas., 600 E. Bergman St., Louisville, Ky.
Clark Stek-O Corp., 1631 Dewey Ave., Rochester 13, N. Y.
Clauss Shear Co., Fremont, O.
Clay Equipment Corp., Cedar Falls, Ia.
Clayton & Lambert Mfg. Co., 14247 Tireman Ave., Dearborn,
Mich.

Clearing Machine Corp., 6499 W. 65th St., Chicago.
Clendenin Brothers, Inc., 108 South St., Baltimore 2, Md.
Clements Mfg. Co., 6650 S. Narragansett Ave., Chicago.
Clemenson Bros., Inc., Middletown, N. Y.
Cleveland Co-Op. Stove Co., 67th & Central Ave., Cleveland.
Cleveland Punch & Shear Works Co., E. 40th & St. Clair Ave.,
Cleveland

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Cleveland.
Cleveland Steel Products Corp., Torridheet Div., Madison Ave. at W. 74th St., Cleveland.
Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.
Clizbe Bros. Mfg. Co., P. O. Box 31, Plymouth, Ind.
Clough, A. W., 28 S. Broad St., Meriden, Conn.
Coal-O-Matic Stoker Co., Trucksville, Pa.
Coast Insulating Corp., 634 S. Western Ave., Los Angeles.
Cocking, Geo. J., 1336 W. 5th St., Santa Ana, Calif.
Coddington Mfg. Co., E. D., 5024 N. 37th St., Milwaukee.
Colebrook & Sons, Inc., W. H., 246 Walton St., Syracuse, N. Y.
Cole Hot Blast Mfg. Co., 3108 W. 51st St., Chicago 32.
Cole-Sullivan Engineering Co., 1316 3rd St., N., Minneapolis.
Colemna Lamp & Stove Co., 2nd & St. Francis, Wichita, Kan.
Colonial Alloys Co., 2154 E. Somerset St., Philadelphia 34.
Columbia Mills, Inc., Saginaw, Mich.
Columbia Steel Co. (Sub. United States Steel Corp.), Russ Bidg.,

Columbia Steel Co. (Sub. United States Steel Corp.), Russ Bidg., 235 Montgomery St., San Francisco 6.
Columbus Heating & Ven. Co., 182 N. Yale Ave., Columbus, Columbus Metal Products, Inc., 767 N. 4th St., Columbus, O. Comfort Products Corp., 7 W. 147th St., Harvey, Ill.
Commercial Shearing & Stamping Co., 1775 Logan Ave., Youngstown O. town, O.

Compton Shear Co., W. H., 314 Camden, Newark 3, N. J.

Conco Corporation, Mendota, Ill.
Conco Engineering Wks., Div. H. D. Conkey & Co., Mendota, Ill.
Condensation Engineering Corp., 2515 S. Archer Ave., Chicago 8.
Conditionaire Unit Co., 2821 Montrose Ave., Chicago.
Congress Die Casting Div., Congress Tool & Die Co., 3750 East Outer Drive, Detroit. Conklin Brass & Copper Co., Inc., T. E., 54-60 Lafayette St.,

Conkin Brass & Copper Co., Inc., T. E., 54-60 Lafayette St., New York City.
Connor Eng. Corp., W. B., 114 E. 32nd St., New York City 16.
Connors Paint Mfg. Co., Wm., 669-683 River St., Troy, N. Y.
Consolidated Car-Heating Co., Inc., Albany, N. Y.
Continental Diamond Fibre Co., Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark 5, N. J.
Continental Machiner, Inc., 1301 Washington Ave., S., Minneapolis.

apolis.
Continental Products Co., 1150 E. 222nd St., Euclid, O.
Continental Rubber Works, 1900 Liberty Pkwy., Erie, Pa.
Continental Sterew Co., Mt. Pleasant, New Bedford, Mass.
Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Continental Stove Corp., Front & Wainut, Ironton, O.
Controlair, Inc., 607 West Ave., Elyria, O.
Cook, Inc., A. D., Lawrenceburg, Ind.
Cook Electric Co., 2700 Southport Ave., Chicago.
Cooper Co., Clark, Palmyra, N. J.
Cooper & Cooper, Inc., 37 Fenn St., Pittsfield, Mass.
Cooper Oven Thermometer Co., Pequabuck, Conn.
Copeland Refrigeration Corp., Sidney, O.
Index to Advertisers, page 314.

Cooper Roofs Corp., 5060 Plankinton Bldg., Milwaukee. Cooper Roofs Corp., 5060 Plankinton Bidg., Milwaukee.
Copperweld Steel Co., Glassport, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Corbin Screw Corp., 1944 High St., New Britain, Conn.
Corbman Bros., Inc., 315 N. 7th St., Philadelphia.
Cork Import Corp., 330 W. 42nd St., New York City.
Cork Insulation Co., Inc., 155 E. 44th St., New York City.
Cernell Iron Works, Inc., 36th Ave. & 13th St., Long Island City, N. Y.

Coroaire Heater Corp., 1422 Euclid Ave., 1124 Hanna Bldg., Cleveland Transmission Corp., 2340 Eleventh St., Rockford, Ill.

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Cotta Transmission Corp., 2340 Eleventh St., Rockford, Ill. Cox Roofing Co., 1014 North-West Blvd., Winston-Salem, N. C. Cramer Co., Inc., The R. W., Centerbrook, Conn. Crane Co., 336 S. Michigan Ave., Chicago, Ill. Crary Mfg. Co., 396 N. Second St., Middleport, O.
Crescent Tool Co., 230 Harrison St., Jamestown, N. Y. Crise Electric Mfg. Co., 2040 E. Main St., Columbus, O. Crocker-Wheeler Electric Mfg. Co., Ampere 1, N. J. Cross Engineering Co., 160-178 Dundaff St., Carbondale, Pa. Crowe Name Plate & Mfg. Co., 3701 Ravenswood Ave., Chicago. Crown Fuel Saver Co., Richmond, Ind. Crown Iron Works, 1229 N. E. Tyler, Minneapolis. Crucible Steel Co. of America, 405 Lexington Ave., New York City. City.
Curtis Refrigerating Machine Co., 1946 Kienlen Ave., St.
Louis 20. Cutler-Hammer, Inc., N. 12th St. and W. St. Paul Ave., Mil-

Cyclone Fence Div., American Steel & Wire Co., Waukegan, Ill. D

Dahlquist Mfg. Co., Inc., 628 Somerville Ave., Somerville 43,

Dahlstrom Metallic Door Co., S. E. Cor. E. Second & Buffalo Sts., Jamestown, N. Y.

Dallas Engineering Co., Inc., 2000 S. Akard, Dallas, Tex.
Dallman Supply Co., 6th & Q Sts., Sacramento, Calif.
Dalzen Mfg. Co., 12255 E. Eight Mile Rd., Detroit.

Damascus Steel Products Corp., 2215 Kishwaukee St., Rockford,

Ill.
Dampney Co. of America, 1243 River St., Hyde Park, Boston.
Daniels Mfg. Co., Inc., Sam, Daniels Rd., Hardwick, Vt.
Danville Stove & Mfg. Co., Beaver St., Danville, Pa.
Danzer Metal Works Co., Box 201, Hagerstown, Md.
Davidson Hy Duty Roof Fan Co., Newton, Mass.
Davies Air Filter Corp., 118-120 E. 25th St., New York City.
Davis & Co., Inc., Dean W., 549 W. Fulton St., Chicago 6.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8.
Davy Fuel & Supply Co., Stoker Div., 14460 Dexter Blvd.,
Detroit.

Detroit.
Day Co., 810 Third Ave., N. E., Minneapolis 13 Day Co., 810 Third Ave., N. E., Minneapolis 13.

Day & Night Manufacturing Ce., Monrovia, Calif.
Dayton Greenhouse Mfg. Co., P. O. Box 801, Dayton, O.
Dayton Pump & Mfg. Co., 500 N. Webster St., Dayton, O.
Dayton Rogers Mfg. Co., 2830 13th Ave., S., Minneapolis.
Dayton Rubber Mfg. Co., 2345 W. Riverview Ave., Dayton 1, O.
Debevoise Co., 968 Grand St., Brooklyn 6.

De Bothezat Ventilating Equipment Div., American Machine &
Metals Inc. East Moline III.

Metals, Inc., East Moline, Ill.

Decatur Iron & Steel Co., P. O. Box 72, Decatur, Ala.

Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.

Defender Automatic Regulator Co., 308 S. 8th St., St. Louis 2.

De Laval Steam Turbine Co., 300 Nottingham Way, Trenton,

Delaware, Lackawanna & Western Coal Co., 120 Broadway, New York, City.

Delco Appliance Div., General Motors Corp., 391 Lyéli Ave., Rochester 1, N. Y. Delco Products Division, General Motors Corp., 329 E. First St.,

Dayton, O. D'Elia Oil Burner Co., Inc., 145 Stratford Ave., Bridgeport,

Conn.

Deming Co., 148 Aetna St., Salem, O.

Demuth & Sons, Charles, 245 Elm Place, Mineola, L. I., N. Y.

Deniston Co., 4856 S. Western Ave., Chicago.

Densewood Corporation, Elkhorn, Wis.

Densmore-Quinlan Co., 910 74th St., Kenosha, Wis.

Deshler Foundry & Machine Wks., 140 S. East Ave., Deshler, O.

Des Moines Stove Repair Co., 107 S. W. Second Ave., Des Conn.

Moines 5, Is.

Detroit Air Conditioning Service Co., Inc., 1314 Holden Ave.,

Detroit.

Detroit Gasket & Mfg. Co., 12840 Burt Rd., Detroit.

Detroit Graphite Co., 550 Twelfth St., Detroit.

Detroit Lubricator Co., 5900 Trumbull Ave., Detroit 8.

Detroit-Michigan Stove Co., 6900 E. Jefferson Ave., Detroit.

Detroit Moulding Div., 9210 Russell St., Detroit.

Detroit Safety Furnace Pipe Co., 5960 Second Blvd., Detroit.

Detroit Stamping Co., 350 Midland Ave., Detroit.

Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit.

Detroit Stoker Co., General Motors Bldg., Detroit. (Sales & Engineering); Monroe, Mich. (Main Office & Works).

Detroit Surfacing Machine Co., 7433 W. Davison St., Detroit.

Detroit Torch & Mfg. Co., 12057 Cardoni Ave., Detroit.

De Vilbiss Co., 300 Phillips Ave., Toledo 1, O.

Devae & Raynolds Co., Inc., 44th St. & 1st Ave., New York

& Raynolds Co., Inc., 44th St. & 1st Ave., New York

Diamona Castings Co., Terra Cotta Rd., Johnsonburg, Pa.
Diamond Chain & Mfg. Co., 400 Kentucky Ave., Indianapolis 7

Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.
Diamond Manufacturing Co., 243 W. 8th St., Wyoming, Pa.
Diceler Corp., Gasport, N. Y.
Dick Co., Inc., R. & J., 24-48 Sade St., Passaic, N. J.
Dickson, Co., 7420 Woodlawn Ave., Cleveland.
Dickson Co., 7420 Woodlawn Ave., Chicago.
Dickson Coal Co., 30 Rockefeller Plaza, New York City.
Dickson Weatherproof Nail Co., P. O. Box 590, Evanston, Ill.
Dieckmann Co., Ferdinand, 1180 Harrison St., Cincinnati, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Diener Mfg. Co., Geo. W., 400 N. Monticello Ave., Chicago.
Disston & Sons, Inc., Henry, Unruh & Milner Sts., Tacony Sta.,
Philadelphia 35.

Philadelphia 35. Doall Co., a Div. Wilkie Enterprises, 1201 Thacker St., Des Plaines, Ill.

Plaines, Ill.
Dockson Corp., 3847 Wabash Ave., Detroit.
Dodge Mfg. Co., 500 S. Union St., Mishawaka, Ind.
Doheny Co., John J., 326 Lake St., Belmont, Mass.
Dollinger Corp., 11 Centre Park, Rochester 4, N. Y.
Dornback Furnace & Fdry. Co., 724 E. 103rd St., Cleveland.
Dow Chemical Co., Midland, Mich.
Dowagiac Steel Furnace Co., Beeson St., Dowagiac, Mich.
Downs-Smith Brass & Copper Co., 304-320 E. 45th St., New York City.

York City.

Opyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand

Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Rapids, Mich.
Dracco Corp., 4057 E. 116th St., Cleveland, O. Dragert Co., C. H., Inc., 237 India St., Brooklyn.
Dravo Corp., Neville Island, Pittsburgh.
Drayer-Hanson, Inc., 738 E. Pico Blvd., Los Angeles 21.
Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36. Dry-Zero Corp., 222 W. North Bank Drive, Chicago 54. Dual-Air Fan Corp., 711 W. Lake St., Chicago.
Dual Remote Control Co., Wayne, Mich. Dunn, Inc., Struthers, 1321 Arch St., Philadelphia 7. Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich. du Pont de Nemours & Co., E. I., Wilmington 98, Del. Durakool, Inc., 1010 N. Main St., Elkhart, Ind. Duraloy Co., Scottdale, Pa. Duriron Co., Inc., 450 N. Findlay St., Dayton, O.

Duraloy Co., Scottdale, Pa.
Duriron Co., Inc., 450 N. Findlay St., Dayton, O.
Duro Metal Products Co., 2649 N. Kildare Ave., Chicago.
Dusing & Hunt, Inc., 1927 Elmwood Ave., Buffalo, N. Y.
Dutton Asbestos & Supply Co., 532 Natoma St., San Francisco.
Dwyer Mfg. Co., F. W., 565 W. Washington St., Chicago.
Dyer Welder & Engineering Co., 7 E. 19th St., Kansas City 8,

Dynamic Air Engineering, Inc., 843 San Julian St., Los An-

Eagle-Picher Lead Co., American Bldg., Central Pkwy. & Wal-Eaglesfield Ventilator Co., 910-20 Dorman St., Indianapolis. Earl Co., Warren, 3409 McKinney Ave., Houston, Tex. East Anaheim Sheet Metal Works, 2299 E. Anaheim Blvd., Long

Beach, Calif.
Eastern Air Devices, Inc., 585 Dean St., Brooklyn 17.
Eastern Oil Equipment Co., 15 Portland St., Portland, Me.
Eastern Rolling Mill Co., P. O. Box 1975, Baltimore, Md.
Eastern States Supply Co., 127 Troutman St., Brooklyn.
Eav-Tex Co., 307 Lincoln Ave., Upper Darby, Pa.
Eclipse Air Brush Co., Inc., 381 Park Ave., Newark, N. J.
Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J.
Eclipse Fuel Engineering Co., 707 S. Main St., Rockford, Ill.
Economy Electric Mfg. Co., 4634 W. 21st Pl., Cicero, Ill.
Economy Pumps, Inc., 1000 Weller Ave., Hamilton, O.
Eddy Stoker Corp., 4717 W. North Ave., Chicago 39.
Edison, Inc., Thomas A., Instrument Div., Lakeside Ave., West
Orange, N. J.

Orange, N. J.
Edwards Furnace Co., 25 East Ave., Wellsboro, Pa. Edwards Mfg. Co., Inc., 387 Eggleston Ave., Cincinnati, O. Ehret Magnesia Mfg. Co., Valley Forge, Pa. Elermann Floor Scraper Co., 148 Irving Ave., Port Chester,

N. Y.
Eiker Mfg. Co., Ogaliala, Nebr.
Eisler Engineering Co., 761 S. 13th St., Newark, N. J.
Eico Tool & Screw Corp., 1800 Broadway, Rockford, Ill.
Electric Arc, Inc., 152 Jeliff Ave., Newark, N. J.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland.
Electric Furnace Man, Inc., 4th & Furnace Sts., Emmaus, Pa.
Electric Machinery Mfg. Co., 1331 Tyler St., N. E., Minneapolis 13.

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Electric Materials Co., Clay & Washington Sts., North East, Pa.

Electric Soldering Iron Co., Inc., W. Elm St., Deep River, Conn.

Electric Sprayit Co., 1415 Illinois Ave., Sheboygan, Wis.

Electric Vacuum Cleaner Co., Inc., 1734 Ivanhoe Rd., Cleveland 10.

Electric Valve Mfg. Co., Inc., 68 Murray St., New York City 7. Electrimatic Div., The Simoniz Co., 2100 Indiana Ave., Chi-

cago 16.
Electroaire Corp., 1455 W. Congress St., Chicago.
Electrogas Furnace Co., 255 Ninth St., San Francisco.
Electroyent Manufacturing Co., 253 Chestnut St., Passaic, N. J.
Electrovent Corp., 5245 Western Ave., Detroit, Mich.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago.

Elgo Shutter & Mfg. Co., 6970 W. Jefferson Ave., Detroit 17.
Ellisen Draft Gage Co., 214 W. Kinzie St., Chicago 10.
Elsey Metal Specialities Co., 1535 Spruce St., Detroit, Mich.
Emerson Electric Mfg. Co., 1843 Washington Ave., St. Louis.

Empire Door Co., Inc., 226 E. 144th St., New York City. Empire Metal Co., 820 E. Water St., Syracuse, N. Y. Empire Sheet & Tin Plate Co., N. Bowman St., Mansfield, O. Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y. Engelhard, Inc., Chas., 90 Chestnut St., Newark, N. J. Engelhard, Inc., Chas., 90 Chestnut St., Newark, N. J. Engineering & Research Corp., Riwerdale, Md. Enterprise Foundry, Inc., 1123 E. "B" St., Belleville, Ill. Equipment Engineering Co., 2853 Columbus Ave., Minneapolis. Erdle Perforating Co., 717 York St., Rochester 11, N. Y. Ergolyte Mfg. Co., 3627 N. Lawrence St., Philadelphia 40. Eselgroth & Co., 22 Edison Pl., Newark 2, N. J. Essick Mfg. Co., 1960 Santa Fe Ave., Los Angeles. Estate Stove Co., Hamilton, O. Etched Products Co., 3901 Queens Blvd., Long Island City. Eugene Excelsior Co., Eugene, Ore. Eutectic Welding Alloys Co., 40 Worth St., New York City 13. Evanoli Div., Evans Products Co., 15310 Fullerton Ave., Detroit. Evans Machine Co., L. R., Sandwich, Ill. Evercrete Corp., 19 W. 44th St., New York City. Everhot Mfg. Co., 57 S. 19th Ave., Maywood, Ill. Everte Pump & Mfg. Co., Inc., 617 N. Price St., Lancaster, Pa. Excel Heating & Air Conditioning Co., 3715 Belmont Ave., Chicago 18. Excello Oil Heating Corp., 111½ S. 24th St., Omaha, Neb.

Excel fleating Corp., 111½ S. 24th St., Omaha, Neb. Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago. Excelsior Stove & Mfg. Co., 510 S. Front St., Quincy, Ill. Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

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Fafnir Bearing Co., 37 Booth St., New Britain, Conn. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago. Fairfield Oil Heating Co., Inc., Mason St., Greenwich, Conn. Fairmont Aluminum Co., Fairmont, W. Va. Falstrom Co., Main Ave. & D. L. & W. R. R., Passaic, N. J. Fargo Foundry Co., 32 N. P. Ave., Fargo, N. D. Farquhar Furnace Co., 150 Owens Ave., Wilmington, O. Farr Co., 2615 Southwest Dr., Los Angeles 43. Farrell-Cheek Steel Co., Stoker Parts Div., First & Lane Sts., Sandusky. O. Sandusky, O.
Farelloy Co., Inc., 1243 N. 26th St., Philadelphia.
Farrls Furnace Co., 920-930 Enos Ave., Springfield, Ill.
Faultless Heater Corp., 10217 St. Clair Ave., Cleveland.
Favorite Manufacturing Co., 440 Weber St., Piqua, O.
Fedders Mfg. Co., Inc., 57 Tonawanda St., Buffalo 9.
Fedders Mgg. Co., 11031 Shoemaker St., Detroit 13.
Federal-Mogul Corp., 11031 Shoemaker St., Detroit 13.
Fee & Mason Mfg. Co., 81 Beekman St., New York City.
Fee & Stemwedel, Inc., 2210 Wabansia Ave., Chicago.
Felters Co., Inc., 210 South St., Boston, Mass.
Fern, Ralph, 2517 Boulevard Ave., Scranton 9, Pa.
Ferro Enamel Corp., Liquid Plastics Div., 4150 E. 56th St.,
Cleveland 5. Sandusky, O.

• Field Control Div., H. D. Conkey & Co., Drawer 111, Mendota,

Figge Mfg. Co., 189 W. Madison St., Chicago.
Fingles Co., The, Reisterstown Rd. at Elgin Ave., Baltimore.
Fireline Stove & Furnace Lining Co., 1816 Kingsbury St., Chicago 14.

cago 14.

Firemood Machine Wks., Converse, Ind.

Firestone Tire & Rubber Co., Firestone Park, Akron, O.

Fir-Tex Insulating Board Co., St. Helens, Ore.

Fisher Governor Co., 203 S. First Ave., Marshalltown, Ia.

Fitzgibbons Boller Co., Inc., 101 Park Ave., New York City 17.

Fienm Lead Co., Inc., Bradley Ave. & School St., Long Island

City 1, N. Y.

Flexo Supply Co., Inc., 4221 Olive St., St. Louis 8.

Flintkote Co., 30 Rockefeller Plaza, New York City 20.

Flood Co., 6217 Carnegie Ave., Cleveland.

Floral City Co., 402 S. Monroe St., Monroe, Mich.

Florence Stove Co., 205 School St., Gardner, Mass.

Floyd-Wells Co., Royersford, Pa.

Floral City Co., 402 S. Monroe St., Monroe, Mich. Florence Stove Co., 205 School St., Gardner, Mass. Floyd-Wells Co., Royersford, Pa.
Flynn & Emrich Co., 301 Holliday St., Baltimore.
Follansbee Steel Corp., Third & Liberty Aves., Pittsburgh 30.
Follansbee Steel Corp., Third & Liberty Aves., Pittsburgh 30.
Follansbee Steel Corp., Third & Liberty Aves., Pittsburgh 30.
Ford Roofing Products Co., 2500 W. 27th St., Cleveland 13.
Ford Roofing Products Co., 2500 W. 27th St., Cleveland 13.
Forman Air Conditioning & Engineering Co., 346 W. 40th St., New York City.
Fossum Mfg. Co., M. H., 1795 St. Clair Ave., St. Paul.
Fox Control & Mfg. Co., 3589 E. 93rd St., Cleveland.
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.
Foy Stoker Mfg. Co., 1419 Diversey, Chicago.
Franklin Gas Heating Co., 1232 Vine St., Cincinnati.
Fraser. & Johnston Co., 725 Potrero Ave., San Francisco 10.
Freedrick Iron & Steel Co., E., 7th & East Sts., Frederick, Md.
Freed Products Co., 1510 Third Ave., Moline, Ill.
Fresh'nd-Aire Co., 4940 Sheridan Road, Chicago 40.
Frey & Co., Frank P., 2634 W. Madison St., Chicago.
Friek Co., W. Main St., Waynesboro, Pa.
Friedley-Voshart Co., 763 W. Lexington St., Chicago.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave. & Loch Raven Blvd., Towson 4, Md.
Frigidaire Div., General Motors Corp., 300 Taylor St., Dayton, O.

ton, O.

 Front Rank Furnace Co., Div. Liberty Foundry Co., 2500 Ohio Ave., St. Louis.
 Fuel Savers, Inc., 15th & Herr St., Harrisburg, Pa.
 Fuller-Warren Co., 2506 N. 32nd St., Milwaukee.
 Fulton Sylphon Co., Box 400, Knoxville, Tenn.
 Furbio Co., Hermansville, Mich. Furnaceslave, Inc., 1080 E. 52nd St., Indianapolis.

G

G. & O. Mfg. Co., 138 Winchester Ave., New Haven, Conn.
G. & S. Tool Co., 8790 Grinnell, Detroit.
G. D. S. Machinery & Supply Co., 101 Walker St., New York City.

G. M. Manufacturing Cq., 50 W. Third St., New York City 12.

Gale Products, Galesburg, III.

Gallaher Co., Box 434, Owatonna, Minn.

Galva Heater Co., Galva, III.

Galv-Weld, Inc., 314 W. First st., Dayton 2, O.

Gammeter Co., W. F., Lincoln Ave. Extension. Cadiz, O.

Gar Wood Industries, Inc., 7924 Riopelle St., Detroit.

Garber Lumber & Construction Co., Strasburg, O.

Garden City Fan Co., 332 S. Michigan Bivd., Chicago 4.

Garden City Laboratory, Inc., 2744 W. 37th Pl., Chicago.

Gardiner Metal Co., 2514 W. 48th Pl., Chicago.

Gascol Furnace Co., The, 3126 Preble Ave., Pitisburgh.

Gasconaire, Inc., 3255 Goldner Ave., Detroit.

Gascoroll Mfg. Corp., Genoa City, Wis.

Gates Rubber Co. Sales Div., Inc., 999 S. Broadway, Denver 17,

Colo. City.

Colo.
Gaul Air Conditioner Co., 3116 N. Main St., Dayton, O.

Gehl Bros. Mfg. Co., West Bend, Wis.
Gehri Co., 1117 Tacoma Ave., Tacoma, Wash.
General Air Conditioning Corp., 4411 Appleton St., Cincinnati.
General Aire Co., 118 N. Sixth St., Philadelphia.

General Blower Co., 403 N. Peoria St., Chicago 22.
General Blower Co., Inc., 5335 Market St., Philadelphia 39.
General Blower Corp., 1450 Army St., San Francisco.

General Controls Co., 801 Allen Ave., Glendale 1, Calif.

General Electric Co., Air Cond. and Com. Refr. Divs., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Plastics Div., 1 Plastics Ave., Pittsfield, Mass.

Mass.

General Electric Co., 1 River Rd., Schenectady, N. Y.
General Equipment Co., 311-15-19 S. Wichita St., Wichita, Kan.
General Etching & Mfg. Co., 3076 W. Grand Ave., Chicago.
General Gas Light Co., 212 N. Park St., Kalamazoo 11F, Mich.
General Heating Products Co., 3353 University Ave., Minne-

apolis apolis.

General Insulating Products Co., 8821 15th Ave., Brooklyn.

General Machine Co., Inc., Fourth & Furnace Sts., Emmaus, Pa.

General Machinery Co., 3500 Riverside Ave., Spokane, Wash.

General Metal Products Co., 3883 Delor St., St. Louis.

General Motors Corp., Moraine Products Div., Dayton, O.

General Oil Heating Corp., 528 Jefferson St., West New York,

N. J. General Plate Div., Metals & Controls Corp., 34 Forest St., At-

tleboro, Mass. General Refrigeration Div., Yates-American Machine Co., Shir-

land Ave., Beloit, Wis.
General Sales & Products Co., 242 Saratoga St., Cohoes, N. Y.
General Sheet Metal Works, Inc., Silliman Ave. & Ash St.,
Bridgeport, Conn.

Bridgeport, Conn.
Gerard Chemical Co., \$7 Front St., Elizabeth, N. J.
Gerard Chemical Co., \$7 Front St., Elizabeth, N. J.
Gerard Corp., M. A., 722 W. Winnebago St., Milwaukee 5.
Gerhardt, W. F., 2007 W. Broad St., Richmond, Va.
Gerock Bros. Mfg. Co., 1300 S. Vandeventer Ave., St. Louis.
Gerstein & Cooper Co., 1 W. Third St., South Boston. Mass.
Geuder, Paeschke & Frey Co., W. St. Paul Ave., and N. 15th St.,
Milwaukee Milwaukee.

Giant Mfg. Co., South Ave., Council Bluffs, Ia.
Gibraltar Engineering Co., 911 N. Orange Dr., Los Angeles.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert & Son, Harry E., 220 Brooklawn Terrace, Bridgeport.

Conn.

Gillen Co., J. L. Dowagiac, Mich.
Gillian Mfg. Co., 7752 Dubols St., Detroit.
Gilmer Co., L. H., Cottman & Keystone Sts., Tacony, Phila-Glasby Mfg. Co., Inc., J. P., Locust Ave. & Nelson St., Bloom-

Glasby Mfg. Co., Inc., J. P., Locust Ave. & Neison St., Bloomfield, N. J.
Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn, N. Y.
Gleason-Avery, Inc., 27 Clark St., Auburn, N. Y.
Glidden Co., 11001 Madison Ave., Cleveland 2.
Globe Iron Roofing & Corrugating Co., Newport, Ky.
Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland.
Globe Machinery & Supply Co., E. 1st & Court Ave., Des Moines, In.

Goese Mfg. Co., 2548 N. 18th St., Milwaukee 6. Goethel Sheet Metal Works, Alfred, 1912 N. Killian Pl., Mil-

Golden-Anderson Valve Specialty Co., Fulton Bidg., Pittsburgh. Goldens' Foundry & Machine Co., P. O. Box 96, Columbus, Ga. Gold Seal Laboratories, 234 S. 4th St., Minneapolis 1. Gold Star Oil Burner Mfg. Co., 146 Warburton Ave., Yonkers, N. Y.

Goodrich Co., B. F., 500 S. Main St., Akron, O. Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O. Gould Engineering Co., 110 Brookline Ave., Cambridge, Mass.

Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y. Governair Corp., 617 N. W. Second St., P. O. Box 1654, Okla-Governair Corp., 6: homa City, Okla.

homa City, Okla.

Grabler Manufacturing Co., 6565 Broadway, Cleveland.

Grammes & Sons, Inc., L. F., 388 Union St., Allentown, Pa.

Grand Rapids Blow Pipe & Dust Arrester Co., 526 Monroe Ave.,

Grand Rapids Die & Tool Co., Div. Expert Die & Stamping Co.,

329 Scribner Ave., Grand Rapids 4, Mich.

Grand Rapids Wire Products Co., 503 Front Ave., N. W., Grand

Rapids 4. Mich.

Rapids 4, Mich.

Granite City Steel Co., 20th & Madison Ave., Granite City, Ill. Grant Wilson, Inc., 4101 W. Taylor St., Chicago.

Graton & Knight Company, 356 Franklin St., Worcester, Mass. Gray, G. L., 509 Grand Ave., New Haven 3, Conn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y. Great Lakes Steel Corporation, Ecorse, Detroit.
Great National Air Conditioning Corp., 2125 N. Harwood St., Dallas 1, Tay

Green Colonial Furnace Company, 322 S. W. Third St., Des Moines, Ia. Moines, 1a.

Green Fire Brick Co., A. P., Mexico, Mo.

Green Mfg. Co., 605 W. Washington St., Chicago.

Greene, Tweed & Co., 4377 Bronx Blvd., Bronx, N. Y.

Greenlee Tool Co., 2136 Twelfth St., Rockford, Ill.

Griscom-Russell Co., The, 235 Madison Ave., New Yor

Griswold Mfg. Co., 1001-1065 W. 12th St., Erie, Pa. Grob Brothers, Grafton, Wis. Grobet File Corp. of America, 421 Canal St., New York City. Grossenbacher Furnace Co., 9416 W. Milton Ave., St. Louis. Guardian Electric Mfg. Co., 1400 Washington Blvd., Chicago 7. Guardian Utilities Co., 215 E. Michigan St., Michigan City, Ind. Guth Co., Edwin F., 2615 Washington Blvd., St. Louis 3.

H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia.
H P L Mfg. Co., 2015 E. 65th St., Cleveland.
Hague & Co., Inc., Alfred, 227 34th St., Brooklyn, N. Y.
Haines Gauge Company, Inc., 2301 W. Allegheny Ave., Philadelphia. (Thickness Gauges)

Hall-Neal Furnace Co., 1324 N. Capitol Ave., Indianapolis 7.
City 8, Mo.
Hallstead Iron Founday, Hallstead Fr.

Hallstead Iron Foundry, Hallstead, Pa. Hamilton Automatic Stoker Corp., 1637 Dixie Highway, Hamilton, O.

Hammett Electric Mfg. Co., 2558 McGee Trafficway, Kansas City 8, Mo Hammond Machinery Builders, 1626 Douglas Ave., Kalamazoo,

Mich. Hampton Electric Mfg. Co., Third & Archie Sts., Oakmont, Pitts-

Handelan Washed Air Co., 4006 Washburn Ave., South Minne-

apolis. Handley Brown Heater Co., 209 E. Washington Ave., Jackson,

Mich

Handy & Harman, 82 Fulton St., New York City 7. Hansen Mfg. Co., Inc., Princeton, Ind. Hardinge Oil Burner & Mfg. Co., 1770 Berteau Ave., at Ravenswood, Chicago.

Hare Stoker Corp., 4853 Rivard St., Detroit.

Harrischfeger Corp., 4400 W. National Ave., Milwaukee.

Harrington & King Perforating Co., 5649 Fillmore St., Chi-

cago 44.

Harris, A. R., 4546 Hohman Ave., Hammond, Ind.

Harris Calorific Co., 5501 Cass Ave., N. W., Cleveland.

Hart & Cooley Mfg. Co., Holland, Mich.

Hart & Crouse Corporation, 301 Turner St., Utica, N. Y.

Hart Mfg. Co., Bartholomew & Hamilton Sts., Hartford, Conn.

Hart Mfg. Co., 2006 N. Western Parkway, Louisville 3, Ky.

Hart Oil Burner Div., Avery Farm Machinery Company, 2006 S.

Washington St., Peoria 2, Ill.

Hartzell Propeller Fan Co., 1025 Roosevelt Ave., Piqua, O.

Harvey, Inc., Sid, Valley Stream, N. Y.

Harvey-Whipple, Inc., 55 Emery St., Springfield, Mass.

Haskins Co., R. G., 615 S. California Ave., Chicago.

Hassall, Inc., John, Clay & Oakland Sts., Brooklyn, N. Y.

Hastings Air Conditioning Company, Inc., Box 474, 108 S. Colorado Ave., Hastings, Nebr.

Hastings Air Conditioning Company, Inc., Box 474, 108 S. Colorado Ave., Hastings, Nebr.
Hauek Manufacturing Co., 124-136 Tenth St., Brooklyn 15.
Hauserman Co., E. F., 6800 Grant Ave., Cleveland.
Hays Corp., 782 E. Eighth St., Michigan City, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.
Heath & Milligan Mfg. Co., Div. of The Glidden Co., 1833 S.
Normal Ave., Chicago.
Heating Assurance, E. 124 Augusta, Spokane, Wash.
Heating Equipment Co., 600 Indiana St., San Francisco 7.
Heatlox Furnaces, Inc., 4320 S. Tacoma Way, Tacoma, Wash.
Heatseal Burner Co., 2501 Leavenworth St., Omaha, Nebr.
Hegeler Zinc Co., P. O. Box 599, Danville, Ill.

Heil Co., 3000 W. Montana St., Milwaukee.
Hemp Co., Macomb, Ill.

Heil Co., 3000 W. Montana St., Milwaukee.
Hemp Co., Macomb, Ill.
Hendley & Whittemore Co., 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry & Wright Mfg. Co., 760 Windsor St., Hartford 1, Conn.
Henry Furnace Co., Medina, Ohio.
Herbert & Sons, T. L., 6th & Harrison St., Nashville, Tenn.
Herbusch Corporation, The, Simplex Control Div., 706 Chestnut St. St. Louis 1. Herco Oll Burner Corp., 109 W. Chestnut St., Lancaster, Pa.

Hercules Chemical Co., Inc., 332 Canal St., New York City. Hercules Electric & Mfg. Co., Inc., 2416 Atlantic Ave., Brooklyn.

N. Y.
Heremetal Co., 202 Washington Ave., N., Minneapolis.
Heritage Coal & Stoker Co., 105 E. 63rd St., Chicago.
Herrmann & Grace Co., 671 Bergen St., Brooklyn, N. Y.
Herron-Zimmers Molding Co., 3900 E. Outer Drive, Detroit.
Hess-Snyder Co., Massillon, Ohio. Hess Warming & Ventilating Co., 1221-1227 S. Western Ave.,

Chicago.

Hetzel Roofing Products Co., 67 Main St., Newark.

Hexacon Electric Company, 161 W. Clay, Roselle Park, N. J.

Hill, E. Vernon, 6826 W. Highland Ave., Chicago.

Hillwood Manufacturing Co., 21600 St. Clair Ave., Cleveland 17.

Hilo Varnish Corp., 42-60 Stewart Ave., Brooklyn, N. Y.

Hinde & Dausch Paper Co., P. O. Box 861, Saldusky, O.

Hipoint Corp., Water, Elm & Arnold Sts., Bellefontaine, O.

Hirschman Co., Inc., W. F., 220 Delaware Ave., Buffalo.

Hobart Brothers Co., Canal Lock Square, Troy, O.

Hodell Chain Co., 3924 Cooper Ave., Cleveland.

Hodgman Rubber Co., Framingham, Mass.

Hoffman Specialty Co., Inc., 1001 York St., Indianapolis 7.

Holcomb & Hoke Mfg. Co., 1645 Van Buren St., Indianapolis.

Hollup Corp., Div. National Cylinder Gas Co., 3357 W. 47th

Place, Chicago.

Holly Heating & Mfg. Co., 1000 Fair Oaks Ave., So. Pasadena,

Calif. Chicago.

Holly Heating & Mfg. Co., 1000 Fair Oaks Ave., So. Pasadena, Calif.
Holtum Mfg. Co., Freeport, Ill.
Holtzer-Cabot Electric Co., 125 Amory St., Boston.
Home Furnace Co., 6th St. & P. M. R. R., Holland, Mich.
Home Stove Co., 501 Kentucky Ave., Indianapolis.
Homer Furnace & Foundry Corporation, Coldwater, Mich.
Hones, Inc., Charles A., 122 S. Grand Ave., Baldwin, N. Y.
Hood Co., B. Mifflin, Daisy, Tenn.
Horn Co., A. C., 43-36 Tenth St., Long Island City, N. Y.
Horton Mfg. Co., 3008 University Ave., S. E., Minneapolis.
Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotentot Co., Inc., 2423 Farnam St., Omaha, Nebr.
Hotstream Heater Co., 8007 Grand Ave., Cleveland 4.
Hough Shade Corporation, 1095 S. Jackson St., Janesville, Wis.
Howe and Bassett Co., Inc., 840 University Ave., Rochester,
N. Y.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago.

N. Y.

Howe Ice Machine Co., 2825 Montrose Ave., Chicago.

Howell Electric Motors Co., Howell, Mich.

Howes-Woods Co., 210 Bridge St., Cambridge, Mass.

Hub Specialty Co., 92 Governor Winthrop Rd., Somerville, Mass.

Hubbard Co., 1014 Marquette Ave., Minneapolis.

Hubbell Corp., 319 N. Albany Ave., Chicago.

Hueller Mfg. Co., Inc., H. J., 559 Rogers Ave., Brooklyn, N. Y.

Hugo Mfg. Co., 49th Ave. W. & Superior St., Duluth 7, Minn.

Hunt & Son, C. B., Box 300, Salem, Ohio.

Hunter Fan & Ventilating Co., 400 S. Front St., Memphis, Tenn.

Hussey & Co., C. G., 2850 Second Ave., Pittsburgh.

Huwert Heating Corp., 2375 West Fort St., Detroit.

Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8.

Hyatt Bearings Division, General Motors Corp., Harrison, N. J.

Hyman & Sons, Joseph, Tioga, Livingston and Almond St.,

Philadelphia 34.

Ice Cooling Appliance Corp., Morrison, Ill.
Ideal Commutator Dresser Co., 1084 Park Ave., Sycamore, Ill.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Furnace Co., 2995 E. Grand Blvd., Detroit.
Ideal Heating Corp., 807 East Gage Ave., Los Angeles.
Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41.
Illinois Iron & Bolt Co., 918 S. Michigan Ave., Chicago,
Illinois Testing Laboratories, Inc., 412 N. LaSalle St., Chicago.
Illinois Zinc Co., 2959 W. 47th St., Chicago.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago.
Imperial Electric Co., 64 Ira Ave., Akron, O.
Imperial Molded Products Corp., 2925 W. Harrison St., Chicago.
Independence Stove & Furnace Co., Cor. Hayward & Cottage,
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6.

Independent Register Co., 3747 E. 93rd St., Cleveland 5.
Indian Trailer Corporation, Koolroom Div., 2338 Indiana Ave.,

Industrial Engineering Corporation, Terre Haute, Ind.
Industrial Mfg. & Engineering Co., 3845 N. Ravenswood Ave. Chicago 13.

Industrial Research, Lansdowne, Pa. Industrial Service Laboratories, 7656 W. Forest Home Ave.,

Ingersoil-Rand Co., 11 Broadway, New York City. Ingersoil Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan

Ave., Chicago.

Inland Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago.

Inland Steel Co., 28 S. Dearborn St., Chicago 3.

Insto-Gas Corporation, 1900 E. Jefferson, Detroit 7.

Insul-Wool Insulation Corp., Wichita 12, Kansas.

Insulite Div. Minnesota and Ontario Paper Co., 500 Baker Arcade Bldg., Minneapolis 2.

Inter-Coastal Paint Co., 15th & Southern R. R., East St. Louis,

International Engineering, Inc., 1145 Bolander, Dayton, O. International Engineering Wks., Inc., Framingham, Mass.

International Heater Co., 161 Park Ave., Utica 2, N. Y. International Moistening Co., 489 S. Main St., Providence, R. I. International Nickel Co., Inc., 67 Wall St., New York City 5.

International Register Co., 2620 W. Washington Blvd., Chicago. International Steel Co., 1556 Edgar St., Evansville, Ind., International Vermiculite Co., 11th & Stanford Ave., Springfield,

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• Interstate Machinery Co., Inc., 1433 W. Pershing Road, Chicago 9. Interstate Metal Products Company, Inc., 4401 Ogden Ave.,

Chicago.

Interstate Sales Co., 1123 Broadway, New York City 10.

Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.

pnia 32.

Iowa Foundry Co., W. 2nd & Cook, Sioux City, Ia.

Iowa Paint Mfg. Co., 118-20 Eighth St., Des Moines, Ia.

Iron Fireman Mfg. Co., 3121 W. 106th St., Cleveland 11.

Irving Varnish and Insulator Co., 6 Argyle Terrace, Irvington 11, N. J. Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

Jackson-Bangor Slate Co., Pen Argyl, Pa.

Jackson & Church Co., 321 N. Hamilton St., Saginaw, Mich.
Jackson Oil Burner Co., 4385 Pacific Ave., Detroit.
Jackson Sheet Metal Works, 3012 Washington Ave., Ogden,

Jacobs Co., B. & J., 1725 Johns St., Cincinnati. Jacobson Machine Works, Inc., A. E., 1090 Tenth Ave., S. E., Minneapolis.

Minneapolis.

Jaden Mfg. Co., Inc., F., 1601 W. 2nd St., Hastings, Nebr.

Jamar Co., Walker, 367 S. First Ave., E., Duluth, Minn.

James Regulator Co., Inc., Peacock St., Pottsville, Pa.

Jamestown Metal Corp., 104 Blackstone Ave., Jamestown, N. Y.

Jamieson Mfg. Co., 820 Eagle Ford Road, Dallas, Tex.

Janette Mfg. Co., 556 W. Monroe St., Chicago.

Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.

Jefferson Machine Tool Co., Fourth, Cutter & Sweeney Sts.,

Cincinnati.

Jefferson Machine Tool Co., Fourth, Cutter & Sweeney Sts., Cincinnati.

Jessop Steel Co., Lock Box 489, Washington, Pa.

Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.

Jiffy Manufacturing Co., Hillside, N. J.

Jiggers, Inc., 215 W. Illinois St., Chicago.

Johns-Manville, 22 E. 40th St., New York City 16.

Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.

Johnson Co., Lloyd S., 2241 Indiana Ave., Chicago 16.

Johnson Manufacturing Corporation, Albion, Mich., and Chrysler Building, New York City.

Johnson Co., S. T., 940 Arlington Ave., Oakland 8, Calif., and

401 N. Broad St., Philadelphia 8.

Johnson Fan & Blower Corp., 1319 W. Lake St., Chicago.

Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar

Rapids, Ia.

Johnson Gas Appliance Co., 520 E. Ave., N. W., Cedar Rapids, Ia.

Johnson, Inc., William, Brenner & Kent Sts., Newark, N. J.

Johnson Ladder & Shoe Co., Eau Claire, Wisconsin.

Johnson Mfg. Co., Tenth & Sycamore, Waterloo, Ia.

Johnson Service Co., 507 E. Michigan St., Milwaukee.

Johnson & Chapman Co., 2925 Carroll Ave., Chicago.

Johnston Co., Wm. W., 115 Bayard St., Dayton, O.

Johnston Gas Furnace Corp., 11847 Vose St., North Hollywood,

Calif. Johnston Tin Foil & Metal Co., 6100 S. Broadway, St. Louis 11. Joliet Heating Corp., 1403 Herkimer St., Joliet, Ill. Jones & Laughlin Steel Corp., Third Ave. & Ross St., Pitts-

burgh Jones Foundry & Machine Co., W. A., 4401 W. Roosevelt Rd., Chicago 24.

Jones Products Corporation, Ferndale, Mich. Jordan & Co., Paul R., 311 E. South St., Indianapolis. Juniper Elbow Company, Inc., 72-15 Metropolitan Ave., Middle Village, L. I., N. Y.

Kais Sunrise Works, 5659 Linwood Ave., Detroit.
Kaiser Co., H. S., 3336 Franklin Blvd., Chicago.
Kane Mfg. Corporation, Kane, Pa.
Katelman Foundry & Mfg. Co., Third Ave. & Eleventh St.,
Council Bluffs, Iowa.
Kaustine Co., Inc., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kaybar Burner Corp., 4545 Cottage Grove Ave., Chicago.
Keasbey Co., Robert A., 139 W. 19th St., New York City.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Kehm Corporation, 135 S. LaSalle St., Chicago 3.
Keith Furnace Co., Dean Ave. at E. 26th, Des Moines, Ia.
Keldur Corp., 420 Lexington Ave., New York City 17.
Keller, Inc., Wm. H., P. O. Box 268, Grand Haven, Mich.
Kelley Manufacturing Co., P. O. Box 17, Houston, Texas.
Kelsey Heating Co., Inc., 277 James St., Syracuse, N. Y.
Kelvinator Division, Nash-Kelvinator Corp., 14250 Plymouth
Rd., Detroit 32.
Kelvin-White Co., 90 State St., Boston 9.
Kennard, Inc., Sam, 4821 Easton Ave., St. Louis 13..
Kennard, Inc., David E., 53 Second Ave., Brooklyn, N. Y.
Kent & Co., Inc., 167 Canal St., Rome, N. Y.
Kent & Co., Inc., J. King, 6417 Manchester Ave., St. Louis.
Kerenchen Co., 333 N. Michigan Ave., Chicago 39.
Kevannee Boller Corporation, Franklin St. & "Q" Tracks, Kewanee, Ill.

Keystone Asphalt Products Co., 43 E. Ohio St., Chicago 11. Keystone Carbon Co., Inc., St. Marys, Pa. Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington,

Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 2013 43rd St., North Bergen, N. J.
Kimberly-Clark Corp., Neenah, Wis.
King Metal Co., 414 N. W. Fourth St., Oklahoma City, Okla.
King Ventilating Co., Box 178, Owatonna, Minn.
Kingston Products Corporation, 1415 N. Webster, Kokomo, Ind.
Kinnear Mfg. Co., P. O. Box 598, Columbus, O.
Kirk & Blum Mfg. Co., 2820 Spring Grove Ave., Cincinnati.
Kitson Co., 1500 Walnut St., Philadelphia.
Klauer Mfg. Co., 9th & Washington St., Dubuque, Ia.
Klee Co., George B., 2163 Dana Ave., Cincinnati 7.
Kleenaire Corp., 409 Jefterson St., Stevens Points, Wis.
Kleen-Heet, Inc., 1823 Carroll Ave., Chicago.
Klein Stove Co., Trenton Ave. & Tioga St., Philadelphia.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Klipfel Mfg. Co., 2651 W. Harrison St., Chicago.
Klomparens Lock-Joint Co., Bethesda 14, Md.
Kluegel & Co., E., 187 W. Kellogg Bivd., St. Paul, Minn.
Knickerbocker Co., 603 Liberty St., Jackson, Mich.
Knight, Maurice A., Kelley Ave., Akron, O.
Knowles Mushroom Ventilator Co., 11 Label St., Montclair, N. J.
Kol-Master Corp., Oregon, Ill.
Koops Furnace Co., 219 W. Van Buren, Danville, Ill.
Kopperma & Sons, Joseph, 316 New St., Philadelphia 6.
Koppers Co., Koppers Bldg., Pittsburgh 19.
Korfund Co., Inc., 48-15 32nd Pl., Long Island City 1, N. Y.
Korth Oll Burner Corp., 123 Hawthorne St., Roselle Park, N. J.
Kralssl Co., Inc., Terhune & Williams Aves., Hackensack, N. J.
Kraker, Henry, 54 W. 14th St., Holland, Mich.
Kramer Bros. Foundry Co., Dayton, Ohio.
Kramer Trenton Co., 626 Brunswick Ave., Trenton, N. J.
Krehbiel Co., J. H., 425 N. Crawford Ave., Chicago.
Kruse Company, 358 W. 16th Pl., Indianapolis.

Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Louis.

Laclede Steel Co., 1317 Arcade Bidg., St. Louis 1.

Laco Oil Burner Co., 238 Union St., Griswold, Ia.

La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La

Crosse, Wis.

LaDel Conveyor & Mfg. Co., S. Broadway & Mill Ave., New LaDel Conveyor & Mfg. Co., S. Broadway & Mill Ave., New Philadelphia, O.
Ladon Co., 902 S. Wabash Ave., Chicago.
Lamb & Ritchie Co., 250 Albany St., Cambridge, Mass.
Lamneck Products, Inc., 1025 Lamneck St., Middletown, Ohio.
Langsenkamp Co., F. H., 229 E. South St., Indianapolis.
Larkin Colls, Inc., 519 Fair St., S. E., Atlanta, Ga.
Lastik Products Co., Inc., 1106 Keenan Bidg., Pittsburgh.
Lau Blower Co., 2005 Home Ave., Dayton 7, O.
Layne & Bowler, Inc., Box 215, Hollywood Sta., Memphls 3, Tenn.

Tenn.

Leader Iron Works, Inc., 2841 N. Jasper St., Decatur, Ill. Leahy Manufacturing Co., 1804 E. 8th St., Los Angeles. Lecourtenay Co., 5 Maine St., Newark 5, N. J. Ledkote Products Co., 35-01 Vernon Blvd., Long Island City,

Leahy Manufacturing Co., 1804 E. Stn St., Los Angeles.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledkote Products Co., 35-01 Vernon Blvd., Long Island City, N. Y.
Lee Co., K. O., P. O. Box 35, Aberdeen, S. D.
Lee & Son, Thomas, 128-132 W. Second St., Cincinnati 2.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44.
Lees, John, Div., Serrick Corp., Muncle, Ind.
Leeson Air Conditioning Corporation, 14631 Møyers Rd., Detroit.
Leffel & Co., James, 426 East St., Springfield, O.
Lehigh Fan & Blower Co., Front & Linden Sts., Allentown, Pa.
Lehon Company, 4411 Oakley Ave., Chicago.
Leland Electric Co., Inc., 1501 Webster St., Dayton, O.
Lenk Mfg. Company, Newton Lower Falls, Mass.
Lennox Furnace Co., 200 S. 12th Ave., Marshalltown, Iowa:
1705 Olentangy River Rd., Columbus, Ohio: 400 N. Midler
Ave., Syracuse, N. Y.
Leslie Welding Co., 2943 Carroll Ave., Chicago.
Levow, David, 308 W. 20th St., New York City 11.
Levy Bros. Company, 2334-2246 E. 38th St., Los Angeles.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Company, Lewin Metals Div., 12th & Chateau
Sts., St. Louis.
Lewis & Co., Inc., Chas. S., 2207 Pine St., St. Louis.
Lewis Laboratories, Inc., Paul, 922 N. 4th St., Milwaukee.
Libbey-Owens-Ford Glass Co., Box 1765 & 1766, Toledo 3, Ohio.
Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Lignum-Vitae Products Corp., 96 Boyd Ave., Jersey City, N. J.
Lincoln Electric Co., 12818 Coit Rd., Cleveland 1.
Linde Air Products Co., 30 E. 42nd St., New York City 17.
Linderme Machine & Tool Co., Inc., 12233 Coyle Ave., Detroit.
Lindsay and Lindsay, 222 W. Adams St., Chicago 6.
Linear Packing & Rubber Co., Inc., State Road & Levick St.,
Tacony, Philadelphia 35.
Link-Belt Co., Stoker Div., 2410 W. 18th St., Chicago 8.
Lion Mfg. Corp., 2640 W. Belmont Ave., Chicago.
Liquefied Gas Appliance Co., Mars, Pa.
Lissberger & Son, Inc., Marks, 23-01 Borden Ave., Long Island
City, N. Y.
Little Burner Co., Inc., 458 E. Pearl St., Cincinnati 2.
Livinguton Repair. South Fountain St., Marshall, Mich.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2. Livingston Repair, South Fountain St., Marshall, Mich.

• Advertisement in this issue. See Index to Advertisers, page 314.

AMERICAN ARTISAN, January, 1944

 Lockformer Co., 4615 Arthington St., Chicago.
 Lockjoint Wood Products Co., 1721 Mildred Ave., Wichita 7. Kan.

Logan-Long Co., 37 W. Van Buren St., Chicago.
Lohman, Inc., William J., 1206 S. Grove St., Irvington, N. J.
Lonergan Manufacturing Co., Albion, Mich.
Lonn Mfg. Co., Inc., 500 N. Dearborn St., Chicago.
Lookout Boiler & Mfg. Co., Manufacturers Road, Chattanooga,

Tenn

Tenn.
Lord Mfg. Co., 1641 W. 12th St., Erie, Pa.
Lovejoy Flexible Coupling Co., 5064 W. Lake St., Chicago 44.
Loweil Flexible Coupling Corp., Otis Building, Philadelphia.
Lowell Wrench Co., 54 Commercial St., Worcester 8, Mass.
Lucas & Company, Inc., John, 322 Race St., Philadelphia.
Ludowici-Celadon Co., 104 S. Michigan Ave., Chicago.
Lukens Metal Co., Thos. F., Hedley & Bath Sts., Philadelphia.
Lukens Steel Co., 308 S. First Ave., Coatesville, Pa.
Lumm Co., A. H., 2512 Albion St., Toledo, Ohlo.
Lyman Co., H. B., Southampton, Mass.
Lyon Conklin & Co., Inc., Race & McComas St., Baltimore 30.

Maas & Waldstein Co., 438 Riverside Ave., Newark 4.
McAlear Mfg. Co., 1901 S. Western Ave., Chicago 3.
McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit.
McCorkle Co., D. H., Sixth & Bancroft Way, Berkeley 2, Calif.
McDonnell & Miller, 400 N. Michigan Ave., Chicago 11.
McKlvaine Products, Inc., 1516 Callowhill St., Philadelphia 30.
McKlva Co. York Pa.

McKay Co., York, Pa. McLeod & Henry Co., Inc., 395A First St., Troy, N. Y. McPherson Furnace & Supply Co., 1805 N. E. 2nd Ave., Portland 12, Ore.

McQuay, Inc., 1600 Broadway, N. E., Minneapolis. MaGirl Foundry & Furnace Works, P. H., 413 E. Oakland Ave.,

Bloomington, Ill.

Magnet Switch Co., 340 W. Huron St., Chicago 10.

Mahon Co., R. C., 850 Mt. Elliott Ave., Detroit.

Maid-O'-Mist, Inc., 215 N. Aberdeen St., Chicago 7.

Main Cornice Works, 1416 N. Main St., Los Angeles.

Majestic Co., 733 Eric St., Huntington, Ind.

Majestic Eleching Company, Politarytown, Pd. at

Majestic Flashing Company, Reisterstown Rd. at Elgin Ave.. Baltimore 17.

Majestic Furnace Co., 1723 Westlake Ave., N., Seattle, Wash. Malco Gear Co., 13904 Lincoln Ave., Dolton, Ill. Mall Tool Company, 7740 South Chicago Ave., Chicago. Malleable Iron Fittings Co., Branford, Conn. Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill. Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long

Island City 1, N. Y. Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.,

61 Willett St., Passaic, N. J.

Manheim Manufacturing and Belting Co., Manheim, Pa.

Manley Products Corp., State & Hay Sts., York, Pa.

Manning, Maxwell & Moore, Inc., American Schaeffer & Budenberg Instrument Div., 11 Elias St., Bridgeport, Conn.

Manufacturer's Fin Coll Co., 2505 S. Pulaski, Rd., Chicago 23.

Manufacturers Successors, Inc., 400 Madison Ave., New York City.

Maple City Furnace Co., 605 S. Main St., Monmouth, Ill.

Maple City Stamping Co., Peoria, Ill.

Maple Valley Mfg. Co., First St., Mapleton, Ia.

Maplewood Machinery Co., 2634 Fullerton Ave., Chicago

Marathon Electric Mfg. Corp., Cherry & Randolph Sts., Wausau,

Wis.

Marblehead Lime Co., 160 N. LaSalle St., Chicago.

Marble-Card Electric Co., Gladstone, Mich.

Marion Furnace Co., 1441 Brooklyn Ave., Detroit.

Marley Chemical Co., 6587 Russell St., Detroit.

Marley Co., 3001 Fairfax Rd., Kansas City 15, Kan.

Marlin-Rockwell Corporation, Jamestown, N. Y.

Marlo Coil Company, 6135 Manchester Ave., St. Louis.

Marquette Mfg. Co., Inc., 401-409 Johnson St., N. E., Minneapolls Minn.

lis, Minn.

Marsh Corporation, Jas. P., 2073 Southport Ave., Chicago 14.

Marsh Lumber Co., Inc., 535-611 Tuscarawas Ave., Dover, O.

Marshall Furnace Co., Dobbins & Hanover Sts., Marshall, Mich.

Marshallan Mfg. Co., 1061 W. 11th St., Cleveland.

Marshalltown Mfg. Co., 901 E. Nevada St., Marshalltown, Ia.

Martens & Stormoen, 15 Hathaway St., Boston 10.

Martin Fan & Blower Co., 1061 W. 16th St., Chicago 8.

Martin, J. O., and C. U., 647 Minna St., San Francisco.

Martin-Parry Corp., W. Market St., York, Pa.

Martocello & Co., Jos. A., 229 N. 13th St., Philadelphia.

Mason-Neilan Regulator Co., 1190 Adams St., Dorchester,

Boston.

Boston. Mason & Sons, F. E., Batavia, N. Y. Mason & Sons, F. E., Batavia, N. Y.
Masonite Corp., 111 W. Washington St., Chicago 2.
Master Electric Co., 126 Davis Ave., Dayton 1, O.
Matthiessen & Hegeler Zinc Co., LaSalle, Ill.
Mauer Engineering, 2525 Colfax St., Evanston, Ill.
Maurath, Inc., 7309 Union Ave., Cleveland.

Mauray Mfg. Corp., 2915 S. Wabash Ave., Chicago.
Maxfield Manufacturing Co., 519 S. Main St., Temple, Tex.

May-Flebeger Co., S. 21st St., Newark, O.

Mayflower Air Conditioners, Inc., 5th Floor, Finch Industrial
Bldg., 5th & Wacouta, St. Paul, Minn.
Mayflower Oil Burner Corp., 5002 Hudson Blvd., West New
York, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.

Mayne Products Co., 324 Harries Bldg., Dayton 2, O. May Oil Burner Corp., Maryland Ave. & Oliver St., Baltimore.

Maysteel Products, Inc., Horicon St., Mayville, Wis.
Maze Co., W. H., Peru, Ill.
Medart Co., 3500 DeKalb St., St. Louis.
Meler Electric & Machine Co., 3525 E. Washington St., Indianapolis.

Mellish & Murray Co., 1715 Carroll Ave., Chicago.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46.
Mercoid Corp., 4201 Belmont Ave., Chicago 41.
Mercury Clutch Corporation, 2049 Dueber Ave., S. W., Canton

6, O.
Meriam Co., 1985 W. 112th St., Cleveland.
Merkle-Korff Gear Co., 217 N. Morgan St., Chicago.
Mesker & Co., Geo. L., 400 N. W. First St., Evansville \$, Ind.
Metal Door & Trim Co., La Porte, Ind.
Metal Marker Co., 1380 E. 40th St., Cleveland.
Metal & Thermit Corp., 120 Broadway, New York City 5.
Metropolitan Refining Co., 23 50th Ave., Long Island City, N. Y.
Metzner Stove Repair Co., 515 Wyandotte, Kansas City, Mo.

Meyer & Bro. Co., F., 1313 S. Adams St., Peoria, Ill.
Meyer Furnace Co., 1300 S. Washington St., Peoria 2, Ill.
Meyers Mfg. Co., 2536 Fourteenth St., Detroit 16.
Meyers Fuel Saver Co., Inc., 313 W. Milwaukee St., Janesville,
Wis.

Wis.

Micheli Air Conditioning Co., Inc., 1725 State St., Schenectady, N. Y. Michigan Tank & Furnace Corp., Lochinvar Products Div., 1401

Prairie Ave., Detroit 4.

Micro Products Co., 20 N. Wacker Dr., Chicago.

Middleton Mfg. & Sales Co., 125 N. First St., Minneapolis.

Midland Paint & Varnish Co., 9115 Reno Ave., Cleveland.

Midwest Aluminum Products, Inc., 123 E. Pittsburgh Ave.,

Milwaukee.

Milwaukee.

Midwestern Supply Co., 1106 N. Clinton Blvd., Bloomington, Ill.

Milburn Co., Alexander, 1426 W. Baltimore St., Baltimore.

Millor Steel Co., 4117 W. Burnham St., Milwaukee 4.

Miller Co., Meridan, Conn.

Miller-Connell Mfg. Co., Inc., 222 W. North Bank Dr., Chicago.

Miller & Doing, 58 York St., Brooklyn, N. Y.

Miller & Son, C. Arthur, 202-204 S. Main St., Elmira, N. Y.

Miller & Son, C. Arthur, 202-204 S. Main St., Elmira, N. Y.

Miller Floor Furnace Co., 741 E. 14th St., Oakland, Calif.

Miller Fange & Furnace Co., The Wm., 310 Main St., Cincinnati.

Millers Falls Co., 57 Wells St., Greenfield, Mass.

Mill-Rose Co., 2498 E. 79th St., Cleveland, O.

Mills Novelty Co., 4110 W. Fullerton Ave., Chicago.

Milwaukee Brush Mfg. Co., 2236 N. 30th St., Milwaukee.

Milwaukee Gas Specialty Company, 2025 W. Clybourn, Milwaukee.

waukee.

Mineral Insulation Co., 103rd & South West Highway, Chicago Ridge, Ill.

• Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., S. Minneapolis 8

neapolis 8.

Minn-Kota Foundry & Mfg. Co., 201 Second St. N., Fargo, N. D.

Minster Machine Co., 270 W. 5th St., Minster, Ohio.

Misener Mfg. Co., Inc., 326 E. Washington St., Syracuse, N. Y.

Mississippi Glass Company, 220 Fifth Avg., New York City.

Mission Water Heater Co., 7101 McKinley Avg., Los Angeles 1.

Mitchell & Smith, Incorporated, Mineral Felt, Div., 9561 Copland

Avg., Detroit 17.

Modern Engineering Co., 3411 Pine Blvd., St. Louis 3.

Modine Mfg. Co., 17th St., Racine, Wis.

Moeller Instrument Co., 132nd St. & 89th Avg., Richmond Hill,

N. Y.

Moeschl-Edwards Corrugating Co., Inc., P. O. Box 1115, Cin-

Mohler Co., J. K., The, 151 Church Ave., Ephrata, Pa. Mojonnier Brothers Co., 4601 W. Ohio St., Chicago. Monarch Engineering Company, 500-600 Linden Ave., Dayton, O. Monarch Furnace Fittings Manufacturers, 4040 W. Lake St.,

Chicago.

Monarch Heating Co., 4661 Alger St., Los Angeles. Monarch Mfg. Works, Inc., Salmon & Westmoreland Sts., Philadelphia

Moncrief Furnace Co., P. O. Box 1673, Astlanta, Ga.
Moncrief Furnace & Mfg. Co., Inc., 3903 Main St., Dallas, Tex.
Monitor Controller Co., 51 S. Gay St., Baltimore 2.
Monmouth Products Co., 1929-41 East 61st St., Cleveland 3. Monmouth Products Co., 1929-41 East 61st St., Cleveland 3, Monogram Combustion Chamber Co., 3646 Cuthbert St., Phila-

Montag Stove & Furnace Works, 2011 N. Columbia Blvd., Portland, Ore.

land, Ore.
Montgomery Brothers, 61 Fremont St., San Francisco.
Moore Corp., Benton St., Joliet, Ill.
Moran Flexible Steam Joint Co., 217 W. Main St., Louisville, Ky.
Morey, Dan, 816 S. Robertson Blvd., Los Angeles 35.
Morris Machine Works, 31 E. Genesee St., Baldwinsville, N. Y.
Morrison Products, Inc., 16816 Waterloo Rd., Cleveland.
Morrison Steel Products, Inc., 601 Amherst St., Buffalo.
Morse Chain Co., Ithaca, N. Y.
Mortell Co., J. W., Hobbie Ave. & Big Four R. R., Kankakee. Ill.

kee, Ill.
Motex Metal Process Corporation, 4473-4475 W. Jefferson Ave., Detroit.

Motorstoker Div. Hershey Machine & Foundry Co., Manheim, Mountain States Equipment Co., 1238 Speer Blvd., Denver 4,

Mt. Vernon Furnace & Mfg. Co., P. O. Box 213, Mt. Vernon, Ill. Mueller Brass Co., Lapeer Ave., Port Huron, Mich. Mueller Co., 512 W. Cerro Gordo St., Decatur B, Ill.

• Mueller Furnace Co., L. J., 2005 W. Oklahoma Ave., Milwau-

kee 7.
Mullins Mfg. Corp., Warren, O.
Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis 8.
Muncie Gear Works, Inc., 700 N. Wysor, Muncie, Ind.
Mundet Cork Corp., 65 S. 11th St., Brooklyn 11.
Mundt & Sons, Charles, 53 Fairmont Ave., Jersey City 4, N. J.
Munn and Steele, Inc., 130 Lister Ave., Newark 5, N. J.
Murnay Co., 3200 Canton Ave., Dallas, Tex.
Murray Corporation of America, 7700 Russell St., Detroit.
Murray Manufacturing Co., D. J., 1002-24 Third St., Wausau,
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Murray Tile Co., Cloverport, Ky.
Myers & Bro. Co., The, F. E., Ashland, O.
Myers Electric Co., 410 Third Ave., Pittsburgh 19.
Myers Ladder Equipment Co., 3121 Buena Vista, Madison, Wis.

N

Nash Engineering Co., Wilson Ave., South Norwalk, Conn.
National Airoil Burner Co., Inc., 1284 E. Sedgley Ave, Philadelphia 34.
National Brass Co., 1603 Madison Ave., Grand Rapids 2, Mich.
National Brass & Copper Co., Inc., P. O. Box 365, Lisbon, Ohio.
National Cylinder Gas Co., 205 W. Wacker Dr., Chicago.
National Engineering & Manufacturing Co., 213 W. 19th St.,
Kansas City, Mo.

Engineering Products, Inc., Commerce & Savings

National Engineering Products, Inc., Commissional Engineering Products, Inc., Commissional Fireproofing Corp., 202 E. Ohio St., N. S., Pittsburgh. National Foundry & Furnace Co., Station "B." Dayton, O. National Gypsum Co., Delaware Ave., Buffalo, N. Y. National Iron Works, Foot of 7 Ave., San Diego, Calif. National Lead Co., 111 Broadway, New York City 6. National Lock Co., Inc., Rockford, Ill. National Machine Tool Co., 1536 Clark St., Racine, Wis. National Machine Works, 122 S. Michigan Ave., Chicago. National Machine Works, 122 S. Michigan Ave., Chicago. National Mag. Corp., 151 Fillmore Ave., Tonawanda, N. Y. National Manufacturing & Engineering Co., 1441 Brooklyn Bldg., Detroit.

National Manufacturing & Engineering Co., 1141 Brooklyn Bidg., Detroit.

National Safety Device Co., 836 W. Hubbard St., Chicago.

National Screw & Mfg. Co., 2440 E. 75th St., Cleveland.

National Steam Pump Co., 701 W. Johnson St., Upper Sandard.

dusky, O.

National Super Service Co., 1944 N. 13th St. Toledo 2, O.

National Time & Signal Corp., 600 E. Milwaukee Ave., Detroit.

Nebel Manufacturing Co., P. O. Box 3942, Shaker Sq. Station, Cleveland.

Cleveland.

Neemes Foundry, Inc., 286 First St., Troy, N. Y.

Neilson Chemical Co., 6564 Benson St., Detroit.

Nelson Co., 2604 4th Ave., Detroit.

Nelson Corporation, Herman, 1824 Third Ave., Moline, Ill.

Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13.

Nesbitt, Inc., John J., State Rd. & Rhawn St. Philadelphia 36.

Nevinger Manufacturing Co., Inc., Greenville, Ill.

New-Aire Blower Co., 23763 Michigan Ave., Dearborn, Mich.

New Albany Machine Mfg. Co., E. 10th & Water Sts, New Albany, Ind.

New Albany Machine Mfg. Co., E. 10th & Water Sts, New Albany, Ind.

New Delphos Mfg. Co., 102-124 S. Pierce St., Delphos, O. New Departure, Div. General Motors Corp., Bristol, Conn. New Haven Copper Co., Seymour, Conn.

New Jersey Zinc Co., 160 Front St., New York City 7.

Newman Brothers, Inc., 662-670 W. 4th St., Cincinnati.

New Mission Htg. & Vent. Co., 3401 Mission St., San Francisco.

New Monarch Machine & Stamping Co., 406 S. W. 9th St., Des Moines, Ia.

Newmort Rolling Mill Co. Div. Andrews Steel Co., 2th & Lowell

Newport Rolling Mill Co., Div. Andrews Steel Co., 9th & Lowell Sts., Newport, Ky.

New Way Products Company, 955 Spitzer Bldg., Toledo, O.

New York Blower Co., 3155 Shields Ave., Chicago 16.

Niagara Blower Co., 6 E. 45th St., New York City 17.

Niagara Machine & Tool Works, 637-697 Northland Ave.,

Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo 11.

Nice Ball Bearing Co., 30th & Nicetown Lane, Philadelphia 40.

Nielco Chemical Co., 6564 Benson St., Detroit.

Niles Rolling Mill Co., Niles, O.

Niles Rolling Mill Co., Niles, O.

Niles Steel Products Division, Republic Steel Corp., 465 Walnut St., Niles, Ohio.

Norge Heating & Conditioning Div., Borg-Warner Corp., 12345 Kercheval Ave., Detroit 14.

Norgren Co., C. A., 222 Santa Fe Dr., Denver, Colo.

Norman-Hoffmann Bearings Corp., Stamford, Conn.

Norman Sheet Metal Mfg. Co., W. F., 212-236 N. Cedar St., Nevada, Mo.

Norris Painting Machinery Corp., 96 Greenwich Ave., Green-

Norris Painting Machinery Corp., 96 Greenwich Ave., Green-

North Fainting Machinery Corp., 96 Greenwich Ave., Green-wich, Conn.

Norristown Magnesia & Asbestos Co., Washington St., Below Ford St., Norristown, Pa.

North American Fibre Products Co., National Building, Cleve-land 13.

North Bangor Slate Co., Bangor, Pa.

Northern Blower Co., 6409 Barberton Ave., Cleveland.

Northern Furnace & Supply Co., 25th St. & 2nd Avenue North,

Billings, Mont.

Northern Steel & Stoker Corp., 3100 Prospect Rd., Peoria, Ill.

Northern Weatherstrip Co., 367 S. 1st Ave., E., Duluth, Minn.

North Penn Co., 72 Fifth Ave., New York City.

Northwest Lead Company, 2700 16th Ave., S. W., Seattle 4, Woesh.

Northwest Stove & Furnace Works, 2345 S. E. Gladstone St., Portland 2, Ore.

• Northwestern Stove Repair Co., 662 W. Roosevelt Rd., Chi-

cago 7.

Nortmann-Duffke Co., 2740 S. 32nd St., Milwaukee.

Norton Brothers, 44 Main St., Greenville, N. Y.

Norwin Co., East Album St., Freeport, Ill.

Norwood Filtration Co., N. Maple St., Florence, Mass.

Nugent Furnace, Thos., 223 E. 30th St., New York City.

NuSteel Company, 1714 S. Ashland Ave., Chicago 8.

Nu-Way Corp., The, 2416 Fourth Ave., Rock Island, Ill.

Oakland Foundry Co., Avenue A & L & N Tracks, Belleville, Ill.
O'Brien Varnish Co., 101 N. Johnson St., South Bend, Ind.
Ohio Brass Co., 380 N. Main St., Mansfield, Ohio.
Ohio Electric Mfg. Co., 5910 Maurice Ave., Cleveland.
Ohio Foundry and Manufacturing Co., Steubenville, O.
Ohio Products Co., 16113 Munn Road, Cleveland 15.
Ohio Wire Froducts Co., 217 N. Tuscarawas Ave., Dover, Ohio.
Ohi & Co., Geo. A., 151-161 Oraton St., Newark, N. J.
Ohmlac Paint & Refining Co., 6550 S. Central Ave., Chicago.
O'Keefe & Merritt Co., 3700 E. Olympic Blvd., Los Angeles.

Olsen Manufacturing Co., The C. A., Elyria, O.
Omaha Stove Repair Works, 1206 Douglas St., Omaha 2, Nebr.
O'Neil-Irwin Manufacturing Co., 316 Eighth Ave., S., Minneapolis 15.

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Orbon Stove Co., L. & N. and Sycamore St., Belleville, Ill.
Original Metal Forming Machine Co., 952 Twentieth Ave.,
Seattle, Wash.
Ormsby-Osterman Company, 3631 Cass Ave., St. Louis.
Osborn Co., J. M. & L. A., 1541 E. 38th St., Cleveland 14.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14.
OverSpred Stoker Co., 1702-77 W. Washington St., Chicago.
Owens-Corning Fiberglas Corp., Nicholas Bidg., Toledo, O.
Ozone Air Company, 928 Cherry St., S. E., Grand Rapids, Mich.
Ozo-Ray Process Corp., 507 W. Monroe St., Chicago.

Pacific Gas Heating Co., 2948 Twentieth St., San Francisco 10. Pacific Lumber Co., 100 Bush St., San Francisco 4. Pacific Pump Works, 5716 Bickett St., Hunting Park, Calif. Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco

Pacific Steel Boiler Div., United States Radiator Corp., Detroit. Packham Crimper Co., Oak St. & N. Y. C. Depot, Mechanics-

Packless Metal Products Corp., 31 Winthrop Ave., New Rochelle,

N. Y.
Page Steel & Wire Div. of American Chain & Cable Co., Inc.,
Monessen, Pa.
Paine Company, 2951 W. Carroll Ave., Chicago 12.
Paint-Point Corporation, 275 Passaic St., Newark, N. J.
Palmer Co., 2501 Norwood Ave., Norwood, Cincinnati 12.
Palmer Electric Co., 20 Sproat St., Detroit.
Palmer Mfg. Co., 3890 E. 91st St., Cleveland.
Palmer Manufacturing Corp., 705 W. Jefferson St., Phoenix,

Pan-American Engineering Company, 820 Parker St., Berkeley,

Calif. Pangborn Corp., Pangborn Blvd., Hagerstown, Md.
Paragon Electric Co., 37 W. Van Buren St., Chicago 5.
Paragon Oil Burner Corp., 75 Bridgewater St., Brooklyn, N. Y.
Paramount Products Co., 545 Fifth Ave., New York City.
Park City Cornice Works, Inc., 729 Union Ave., Bridgeport.

Conn.

Parker Appliance Co., 17325 Euclid Ave., Cleveland 12.

Parker Heating & Manufacturing Co., 1627 Third Ave., S., St.

Petersburg, Fla.

Parker-Kalon Corp., 190-192 Varrick St., New York City 14.

Parker Rust-Proof Co., 2177 E. Milwaukee Ave., Detroit 11.

Parkersburg Iron & Steel Co., Drawer 1070, Parkersburg,

W. Va.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Patent Novelty Company, Fulton, Ill.
Patten Co., J. V., 200 DeKalb Ave., Sycamere, Ill.
Patterson Foundry & Machine Co., East Liverpool, O.
Patterson-Sargent Co., St. Clair, Kopp & 38th St., Cleveland.
Patterson Products Co., 113 S. Penn St., Indianapolis 4.
Payne Furnace & Supply Co., 236 N. Foothill Rd., Beverly

Payne Furnace & Supply Co., 336 N. Foothill Rd., Beverly Hills, Calif.
Peacard Co., M. A., 195 Dudley St., Roxbury Sta., Boston.
Peck, Stow & Wilcox Co., Center St., Southington, Conn. Pecora Paint Co., 4th St. & Erie Ave., Philadelphia 40.
Peerless Electric Co., 2000 W. Market St., Warren, O.
Peerless Foundry Co., 1853 Ludlow Ave., Indianapolis.
Peerless Mfg. Corp., 1400 W. Ormsby St., Louisville 10, Ky.
Peerless Oil Burner Co., Inc., Marion, Ind.
Peerless Pump Div., Food Machinery Co., 301 West Avenue 26, Los Angeles 31.
Peerless Pump Div., Food Machinery Corporation, 1250 Cam-

Los Angeles 31.

Peerless Pump Div., Food Machinery Corporation, 1250 Camden Ave., S. W., Canton 6, Ohio.

Peninsular Stove Co., 2699 Gratiot Ave., Detroit.

Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.

Penn Electric Switch Co., Box 556, Goshen, Ind.

Penn Tool Company, 2415 N. Howard St., Philadelphia 33.

Pennsylvania Engineering Works, 526 S. Jefferson St., New Castle, Pa. Castle, Pa.

Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42.

Pennsylvania Furnace & Iron Co., P. O. Box 269, Warren, Pa. Pennsylvania Salt Mfg. Co., Widener Bldg., Philadelphia 7.

Pennsylvania Wire Glass Co., 1612 Market St., Philadelphia. Pentecost & Craft Co., 429 Wabash Ave., Terre Haute, Ind. Perfection Grate & Stoker Co., 4 Flsk Ave., Springfield, Mass. Perfection Stove Co., 7609 Platt Ave., Cleveland. Perfex Corp., 500 W. Oklahoma Ave., Milwaukee 7.

Perham Products, Inc., 133 N. Wacker Drive, Chicago. Perkins Machine Co., 4 Perkins Ave., Warren, Mass. Perkins Machine Gear Co., Springfield, Mass. Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass. Perkinson & Brown, 412 N. Wolcott Ave., Chicago. Permutit Co., 330 W. 42nd St., New York 18, N. Y. Pernot & Rich, Inc., 2546 San Fernando Rd., Los Angeles 41. Peters-Dalton, Inc., 628 E. Forest Ave., Detroit 1. Peterson "Freezem" Mfg. & Sales Co., 316 Southwest Blvd., Kanaas City, Mo. Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers

Peterson "Freezem" Mfg. & Sales Co., 316 Southwest Blvd., Kansas City, Mo. Petroleum Heat & Power Co., Stamford, Conn. Pfanstlehl Chemical Co., 104 Lakeview Ave., Waukegan, Ill. Pfeifer, Wm., 416 Greenwich St., New York City. Pfening Co., Fred D., 1075 W. 5th Ave., Columbus 8, O. Phelps Dodge Copper Products Corp., British American Tube Div., 40 Wall St., New York City. Phelps Mfg. Co., 301 Thomas St., Little Rock, Ark. Pheoll Manufacturing Co., 5700 Roosevelt Rd., Chicago 50. Philadelphia Gear Co., Erie Ave. & G St., Philadelphia. Philadelphia Thermometer Co., 915 Filbert St., Philadelphia. Philco Radio & Television Corp., Tioga and C Streets, Philadelphia 34. delphia 34.

Phillips Cooling Tower Co., Inc., 114 Liberty St., New York City 6. Phillips Drill Co., 4700 Fifth Ave., Chicago. Phoenix Ice Machine Co., 2711 Church St., Cleveland.

Platt Products Corporation, 1149 S. Pennsylvania Ave., Lansing, Mich. Pier Equipment Mfg. Co., 1440 Milton St., Benton Harbor,

Mich. Pilley Brush Co., Fort Madison, Ia. Pioneer Heat Regulator Division, Master Electric Co., 100 Davis Ave., Dayton, Ohlo. Pioneer Roofing & Sheet Metal Co., 226 N. Main St., Mus-

Rogee, Okla.

Pioneer Water Heater Co., 3005 Andriba St., Los Angeles.

Pittsburgh Furnace Parts Co., 109 Federal St., Pittsburgh.

Pittsburgh Plate Glass Co., 2000 Grant Bldg., Pittsburgh.

Pittston Stove Co., P. O. Box 279, Pittston, Pa.

Plant Rubber & Asbestos Works, Inc., 537 Brannan St., San Francisco

Francisco 7.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7.
Plastic Products Co., 6475 Georgia Ave., Detroit 11.
Pleasantaire Corp., 329 Tower Bidg., Washington 5.
Plibrico Jointiess Firebrick Co., 1800 Kingsbury St., Chicago 14.
Plymouth Industries Inc., 1932 Harrison Ave., Plymouth, Ind.
Pocahontas Fuel Company Incorporated, Stoker Div., 340 E.
131st St., Cleveland.
Poe Co., C. W., Mayfield at Lee, Cleveland 18.
Poe, Ralph W., 306 W. Locust St., Canton, Ill.
Polk Mfg. Co., 2021-23 Winnebago St., Madison, Wis.
Pomona Pump Co. Div., Joshua Hendy Iron Works, 206 E.
Commercial St., Pomona, Calif.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry
Baltimore.

Baltimore. Baltimore,
Portland Stove Fdry, Co., 57 Kennebec St., Portland 2, Me.
Potomac Mfg. Co., 316 S. 10th St., Philadelphia 7.
Power King Tool Corporation, P. O. Box 150, Warsaw, Ind.
Powers Regulator Co., 2720 Greenview Ave., Chicago.
Practical Instrument Co., 2717 N. Ashland Ave., Chicago.
Prat-Daniel Corporation, Port Chester, N. Y.
Precision Control Co., 899 Bryant St., San Francisco.
Precision Thermometer & Instrument Co., 1434 Brandywine St.,
Philadelphia Philadelphia

Preferred Utilities Manufacturing Corp., 1860 Broadway, New York City 23. Premier Furnace Co., Lock Box 150, Dowagiac, Mich. Premier Metal Etching Co., 21-03 44th Ave., Long Island City,

N. Y.
Presstite Engineering Co., 3900 Chouteau St., St. Louis.
Primold Products Corp., 103 Park Ave., New York City.
Propellair, Inc., 1345 Lagonda Ave., Springfield, O.
Protective Coatings, Incorporated, P. O. Box 56, Stratmoor Station, Detroit 27.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis. 20.

Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago. Pyramid Metals Co., 1334 N. Wells St., Chicago. Pyrolite Products Co., 1221-31 W. 74th St., Cleveland 2.

Quaker Mfg. Co., 223 W. Erie St., Chicago 10.
Quick Furnace & Supply Co., 210 Court St., Des Moines 9, Ia.
Quiet-Heet Mfg. Corp., 135 N. J. Railroad Ave., Newark, N. J.
Quigley Company, Inc., 56 W. 45th St., New York City.
Quimby Pump Div., H. K. Porter Co., Inc., 340 Thomas St.,
Newark 5, N. J.

• Quincy Stove Manufacturing Co., 807 S. Front St., Quincy, Ill.

R-S Products Corp., 4530 Germantown Ave., Philadelphia 7. Racine Stoker Mfg. Co., 1014 Eighth St., Racine, Wis. Racine Tool & Machine Co., Erskine & Cook Sts, Racine, Wis. Radiation Furnace Corp., 230 Bond St., Benton Harbor, Mich. Radiator Specialty Co., 1722 Dowd Rd., Charlotte, N. C.

Radiator Specialty Co., 1722 Dowd Rd., Charlotte, N. C. Rafter Machine Co., 259 Stephen St., Belleville, N. J. Ramey Mfg. Co., 243 N. 5th St., Columbus, O. Ramtite Co., Div. S. Obermayer Co., 2563 W. 18th St., Chicago. Ranco Inc., 601 W. Fifth Ave., Columbus 1, O. Randall Graphite Products Corp., 609 W. Lake St., Chicago 6. Ransome Machine Co., Industrial Div., Dunellen, N. J. Ravenna Furnace & Heating Co., Ravenna, O. Rawlplug Co., Inc., The, 98 Lafayette St., New York City. Ray Oil Burner Co., 401-499 Bernal Ave., San Francisco. Reading-Pratt & Cady Div., American Chain & Cable Co., Inc., Reading. Pa.

Reading-Pratt & Cady Div., American Chain & Cable Co., Inc., Reading, Pa.

Read Unit-Fans, Inc., 1001 St. Charles Ave., New Orleans, La. Reeves Pulley Co., 1000 N. Wilson St., Columbus, Ind.

Reeves Steel & Mfg. Co., Lock Box 107, Dover O. Refractory & Insulation Corp., 120 Wall St., New York City 5.

Refrigeration Appliances, Inc., 923 W. Lake St., Chicago.

Refrigeration Economics Co., Inc., 1232 Second St. N. E., Canton Ohio.

Refrigeration Economics Co., Inc., 1232 Second St. N. E., Canton, Ohlo.

Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 7, N. Y.

Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11.

Reichert Float & Mfg. Co., 2238 Smead Ave., Toledo, O.

Reif-Rexoil, Inc., 37 Carroll St., Buffalo.

Reilly Tar & Chemical Corp., 1615 Merchants Bank Bidg., Indianapolis 4.

Reiner & Campbell Co., Inc., 667 Norwood Terrace, Elizabeth,

Reliable Gas Products Co., 1024 Second Ave., W. S., Cedar

Rapids, Ia.
Reliable Perforating Co., 2047 N. Wood St., Chicago.
Reliable Sheet Metal Engineering Co., 4334-50 S. Knox Ave., Chicago.

Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis. Reliance Electric & Engineering Co., 1988 Ivanhoe Rd. N. E., Cleveland 10.

Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago.

Chicago.

Rempe Co., 340 N. Sacramento Ave., Chicago.

Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O. Republic Steel Corp., Republic Bldg., Cleveland 1.

Research Corp., 405 Lexington Ave., New York City.

Research Products Corporation, 1015 E. Washington Ave., Modison 2 Wie

Madison 3, Wis. Retinning Manufacturing Co., 3021 Greenview Ave., Chicago. Revere Copper and Brass Incorporated, 230 Park Ave., New York City 17.

Revere Copper and Brass Incorporated, 230 Park Ave., New York City 17.

Rex Clay Products Company, 14414 Dexter Blvd., Detroit. Reynolds Electric Company, 2685 W. Congress St., Chlcago 12. Reynolds Mfg. Co., 412 Prospect N. E., Grand Rapids, Mich. Reynolds Manufacturing Co., Springfield, Mo.

Reynolds Metals Co., Reynolds Metals Bldg., Richmond 19, Va. Reznor Mfg. Co., Lock Box 231, Mercer, Pa.

Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn. Ribside Furnace Co., 119½ Clinton St., Wausau, Wis. Richards-Wilcox Mfg. Co., Third St., Aurora, Ill. Richmond Fireproof Door Co., Northwest F St., Richmond, Ind. Richmond Radiator Co., Inc., P. O. Box 951, Uniontown, Pa. Riester & Thesmacher Co., 1526 W. 25th St., Cleveland. Riggin Metal Products, Inc., Box 267, Kankakee, Ill. Riley Stoker Corp., 9 Neponset St., Worcester, Mass. Rising & Nelson Slate Co., West Pawlet, Vt.

Riverside Machinery Company, 10632 S. Michigan Ave., Chicago. Riverton, Lime & Stone Co., Inc., Riverton, Va. Roan Mfg. Co., 1220 Washington Ave., Racine, Wis. Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O. Roberts-Gordon Appliance Corp., 137 Arthur St., Buffalo 7. Roberts Tube Works, 2500 Military Ave., Detroit. Roberts-Gordon Appliance Corp., 187 Arthur St., Buriaio 7. Roberts Tube Works, 2500 Military Ave., Detroit. Robertson, F. L., 56 Rano St., Burialo. Robertson Co., H. H., 2400 Farmers Bank Bidg., Pittsburgh 22. Robinson Furnace Co., 4600 W. Monroe St., Chicago. Robinson Insulation Co., P. O. Box 1419, Great Falls, Mont. Rochester Lead Works, Inc., 380 Exchange St., Rochester 8,

N. Y.

Rochester Mfg. Co., Brighton Station, Rochester 10, N. Y.
Rock Fleece Company, 115 Durango St., El Paso, Texas.
Rock Island Register Co., 2425 Fifth Ave., Rock Island, Ill.
Rock Island Stove Co., 200 Fourth St., Rock Island, Ill.
Rockwood Mfg. Co., 1801 English Ave., Indianapolis.
Roebling's Sons Co., John A., 640 S. Broad St., Trenton, N. J.
Roesch & Associates, Inc., 120 E. Washington St., Syracuse,

Rossing Mfg. Co., 1616 Noble St., Sharpsburg Sta., Pittsburgh. Roller Bearing Co. of America, Whitehead Rd., Trenton 3, N. J. Rolyan Corp., 2241 Indiana Ave., Chicago. Rome-Turney Radiator Co., Canal St., Rome, N. Y. Roper Corp., Geo. D., Blackhawk Park Ave., Rockford, Ill. Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore. Rosedale Foundry & Machine Co., Columbus Ave., N. S., Pittsburgh.

Ross Heater & Mfg. Co., Inc., 1407 West Ave., Buffalo. Ross Sprinkler Co., 34 Roberts St., Pasadena, Calif. Rotary Mfg. Co., 5718 Long Beach Ave., Los Angeles. · Advertisement in this issue. See Index to Advertisers, page 314.

Roto-Beam Division, Peeriess of America, Inc., 3300 S. Indiana Ave., Chicago. Round Oak Co., Dowagiac, Mich.
 Roxalin Flexible Finishes, Inc., 800 Magnolia Ave., Elizabeth,

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Royal Air Conditioning Equipment Co., 1024 Westminster Ave., Alhambra, Calif. Royal-Apex Mfg. Corp., 62 Schenectady Ave., Brooklyn, N. Y.

Royal-Apex Mfg. Corp., 62 Schenectady Ave., Brooklyn, N. Y. Royal Ventilator Co., 415 Locust St., Philadelphia 6. Royersford Foundry & Machine Co., 55 Main St., Royersford, Pa. Ruberold Co., The, 500 Fifth Ave., New York City.

Ruby Chemical Co., 74 McDowell St., Columbus 8, O. Rudy Furnace Co., Dowagiac, Mich. Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12. Ruggles-Klingemann Mfg. Co., 4 Foster Ct., Salem, Mass. Russell Electric Co., 342 W. Huron St., Chicago 10. Russell Co., F. C., 1836 Euclid Ave., Cleveland. Russell Mfg. Co., John M., Box 246, Naugatuck, Conn. Rust Products Co. of America, 618 W. Adams St., Chicago. Rusticide Products Co., 3125 Perkins Ave., Cleveland. Rutland Fire Clay Co., 91 Curtis Ave., Rutland, Vt.

Rybolt Heater Co., Miller St., Ashland, O.

Ryerson & Son, Inc., Joseph T., 2553 W. 16th St., Chicago. Ryniker Steel Products Company, 122-124 N. 25th St., Billings, Mont.

S K F Industries, Inc., Front St. & Erie Ave., Philadelphia.
Saftee Glass Co., Stenton Ave. & Louden St., Philadelphia 44.
Saino Mfg. Co., Inc., F. L., 70 W. Colorado Ave., Memphis, Tenn.
St. Charles Mfg. Co., St. Charles, Ill.
St. Clair Foundry Corp., Beech & Wilson Sts., Centralia, Ill.
St. Louis Furnace Mfg. Co., 2901 Elliot Ave., St. Louis.
St. Louis Tool Co., 1521 N. Grand Ave., St. Louis 6.
St. Paul Corrugating Co., Wabasha & Water Sts., St. Paul 1,

Minn. Sall Mountain Co., 176 W. Adams St., Chicago 3, Sampsel Time Control, Inc., 600 N. Strong Ave., Spring Valley,

Sampsel Time Control, Inc., 600 N. Strong Ave., Spring Valley, Ill.

Samson Plaster Board Co., Crosby Bldg., Buffalo.

Sandberg Co., H. J., 500 N. E. Union Ave., Portland, Ore.

Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.

Sanmyer Corporation, 1265 W. North Ave., Chicago.

Sanvin Chemical Products Co., 1617 21st Ave., Moline, Ill.

Sarco Co., Inc., 475 Fifth Ave., New York City.

Sauereisen Cements Co., Sharpsburg, Station, Pittsburgh 15.

Savage Co., W. J., 912 W. Clinch Ave., Knoxville, Tenn.

Saverite Engineering Co., 1031 Clinton St., Hoboken, N. J.

Sawyer Electrical Mfg. Co., 5701 Smithway, Los Angeles.

Schaefer Brush Mfg. Co., 117 W. Walker St., Milwaukee 4.

Scaife Company, Oakmont, Pa.

Schatz Mfg. Co., Fairview, Poughkeepsie, N. Y.

Schecter Brothers Co., Hancock & Huntington Sts., Philadelphia.

Scherr Co., Inc., George, 128 Lafayette St., New York City.

Schill Mfg. Co., 302 Mansfield St., Crestline O.

Schmieg Industries, 312-320 Piquette Ave., Detroit 2.

Schoedinger, F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.

Schubert-Christy Corp., Box 725, Indio, Calif.

Schundler & Co., Inc., F. E., Insulation Div., 504 Railroad St.,

Jollet, Ill.

Schwah Furnace Company, 193 S. Second St., Milwaukee 4.

Joliet, Ill.

Jollet, Ill.

Schwab Furnace Company, 193 S. Second St., Milwaukee 4.
Schwab Safe Co., East Main & Blvd., Lafayette, Ind.
Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis.
Scientific Instrument Co., 531-35 W. Larned St., Detroit 26.
Scott Engineering Co., 23 N. Sixth St., Noblesville, Ind.
Scott-Newcomb, Inc., 1922 Pine St., St. Louis 3.
Scoville Mfg. Co., Morency-Van Buren Div., Prairie Ave.,
Sturgis, Mich.
Sealkote Corp., 40 S. Clinton St., Chicago.
Seamlex Co., 27-27 Jackson Ave., Long Island City 1, N. Y.
Season-Aire Corporation of America, 20 Bartlett St., Detroit.
Security Manufacturing Co., 1630 Oakland Ave., Kansas City 3.

Security Manufacturing Co., 1630 Oakland Ave., Kansas City 3,

Mo. Self-Vulcanizing Rubber Co., Inc., 605 W. Washington Blvd.,

Self-Vuicanizing Rubber Co., Inc., 606 W. Washington Bivd., Chicago.

Semco Mfg. Co., 118-122 Third Ave., N., Nashville, Tenn. Seneca Wire & Mfg. Co., Fostoria, Ohio.

Sentry Mfg. Co., N. E. Cor. 13th & Grace Sts. Omaha, Nebr.

Servel, Inc., Electric Ref. & Air Cond. Div., 119 Morton Ave., Evansville 20, Ind.

Service Machine Co., 158 Miller St., Elizabeth 4, N. J. Service to Industry, Box 133, West Hartford, Conn.

Shafer Bearing Corp., 35 E. Wacker Dr., Chicago.

Shakeproof, Inc., 2501 N. Keeler Ave., Chicago.

Shallcross Co., 48th & Grays Ferry Rd., Philadelphia.

Shamblen Furnace Parts Co., 231-39 First Ave., Pittsburgh. Sharon Steel Corp., Drawer 537, Sharon, Pa.

Shedlov Oil Burners, Inc., 717 Third Ave., S. Minneapolis.

Sheetlock Co., 4521 N., Clark St., Chicago.

Sheet Metal Mfg. Co., Inc., 553 Myrtle Ave., Brooklyn.

Sheet Metal Specialty Company, 3rd & Liberty Ave., Pittsburgh. Sheldon Slate Products Co., Inc., 5 N. Main St., Granville, N. Y. Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland.

Shreveport Engineering Co., Inc., 1553-55 Texas Ave., Shreveport, La.

port, La.
Sight Feed Generator Co., 14 N. Tenth St., Richmond, Ind.
Signal Electric Mfg. Co., P. O. Box 75, Menomines, Mich.
Silent Glow Oil Burner Corp., 1477 Park St., Hartford, Conn.

Silent Sioux Oil Burner Corp., Orange City, Ia.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11.
Simplex Ceiling Co., 60 E. 42nd St., New York City 17.
Simplex Manufacturing Co., 200 North Main St., Fond du Lac.

Simplex Oil Heating Corp., 85 Main St., West Orange, N. J. Sinker-Davis Co., 230 S. Missouri St., Indianapolis 4. Sioux City Foundry and Boiler Co., East 8th & Division Sts.,

Sioux City, Iowa Sipe & Company, James B., Box 8010, S. Hills Branch, Pittsburgh.

burgh.

Sisalkraft Co., The, 205 W. Wacker Dr., Chicago 6.

Skilbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.

Skilsaw, Inc., 5033 Elston Ave., Chicago 30.

Skinner Heating & Ventilating Co., Heater Div. of St. Louis

Blow Pipe & Heater Co., Inc., 1954 N. 9th St., St. Louis 6.

Skuttle Manufacturing Co., 517 E. Larned St., Detroit 26.

Sly Mfg. Co., W. W., 4736 Train Ave., Cleveland 2.

Small Motors, Inc., 1322 Elston Ave., Chicago.

Smidth & Co., F. L., 60 E. 42nd St., New York City.

Smith Heater Co., Peter, 6209 Hamilton Ave., Detroit.

Smith & Kanzler Corp., 516 Lidgerwood Ave., Elizabeth 2, N. J.

Smith Manufacturing Co., Inc., F. A., P. O. Box 509, Rochester 2, N. Y.

Smith Manufacturing Co., Inc., F. A., F. O. Box 805, Recliester 2, N. Y.
Smith-Raymond Co., 1231-33 Tenth Ave., Columbus, Ga.
Smith, R. E., 1513 Monroe St., Waukegan, Ill.
Smith Welding Equipment Corp., 2619-33 Fourth St., S. E.,
Minneapolis 14.
Smith, Inc., Winfield H., 114 Eaton St., Springfield, Eric Co.,

Smooth-on Mfg. Co., 568-574 Communipaw Ave., Jersey City,

N. J.
Snap-On Mfg. Co., 1028 Blue Island Ave., Chicago.
Snap-On Tools Corporation, Kenosha, Wis.
Socony Paint Products, Div. of Socony-Vacuum Oil Co., Inc.,
26 Broadway, New York City 4.
Somers, Inc., H. J., 6063 Wabash Ave., Detroit.
Sonneborn Sons, Inc., L., 88 Lexington Ave., New York City.
Sonner Burner Co., 6th & Andrews, Winfield, Kan.
Soss Manufacturing Co., 21777 Hoover Rd., Detroit.
South Bend Air Products, Inc., 322 E. Colfax, South Bend, Ind.
Southbridge Roofing Co., Inc., Hartwell & Chapin Sts., Southbridge Mass.

bridge, Mass.
Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis 20.
Southern Fan & Blower Co., 1305 S. Lamar St., Dallas, Tex.
Southern States Iron Roofing Co., Stiles Ave. & Louisville Rd.,

Savannah, Ga. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc.,

Savannah, Ga.
Spartan Electric Company, P. O. Box 509, Rochester, N. Y.
Spear Stove & Heater Co., James, 3430 Chestnut St., Philadelphia.

Specialty Converters, Inc., East Braintree, Mass.
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Specialty Converters, Inc., East Braintree, Mass.
Special Company, 1201 Thacker St., Des Plaines, Ill.
Special Research

St. Williamsport, Pa.

Spencer Thermostat Co., Unit of Metals & Controls Corp., 34
Forest St., Attleboro, Mass.

Spencer Turbine Co., 484 New Park Ave., Hartford 6, Conn.

Splegel Corporation, G. B., 3958 Calumet Ave., Chicago.

Spochrer-Lange Co., 3723 Commonwealth St. St. Louis.

Spoehrer-Lange Co., 3723 Commonwealth St., St. Louis.
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Spun Steel Corp., 2037 Dueber Ave., S. W., Canton, O.
Square D Co., 6060 Rivard St., Detroit 11.
Stafford Co., N., 117 53rd St., Brooklyn 32.
Stainless & Steel Products Co., 1000 Berry Ave., St. Paul, Minn.
Standard Asbestos Mfg. Co., 820-22 W. Lake St., Chicago.
Standard Computing Scale Co., Air Conditioning and Refrigeration Div., 2461 E. Grand Blvd., Detroit 11.
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Baltimore.

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Standard Stamping & Perforating Co., 3137 W. 49th Pl., Chicago

Chicago.
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Stanley Mfg. Co., East Monument Ave., Dayton, O. Stanley Tools, New Britain, Conn.
Stanton Heater Co., Martins Ferry, O.
Star Electric Motor Co., 197 Grove St., Bloomfield, N. J.
Star Expansion Bolt Co., 147 Cedar St., New York City 6.

Starr Piano Co. Richmond, Ind. Sta-Warm Electric Co., Ravenna, Ohio. Sta-warm Electric Co., Ravenna, Ohio.
Steamaire Co., Dana Ave. & Newton St., Cincinnati, Ohio.
Steel Products Engineering Co., Combustioneer Div., 1205 W.
Columbia St., Springfield, Ohio.
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Stephens-Adamson Mfg. Co., 55 Ridgeway Ave., Aurora, Ill.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22. geles 22. Sterling Foundry Co., Sterling, Ill.
Ster-Na-Man Fdry. Co., 441 Williams St., Springfield, Ill.
Stewart Foundry, O. S., 887 E. 67th St., Cleveland.
Stewart Ice Machine Co., 1046 East 22nd St., Los Angeles.
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Stewart-Rogers, Inc., 2915 Powelton Ave., Philadelphia 4. Stiglitz Furnace & Foundry Co., 2007-23 Portland Ave., Louisville, Ky. Stok-A-Fire Co., Inc., 6504 Olive Street Road, University City 5, Mo. Mo.
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Stoker-Matic Co., 1415 S. State St., Salt Lake City 4, Utah.
Stoker Products, Inc., 221 W. Prairie Ave., Decatur, Ill.
Stokerunit Corp., 4548 W. Mitchell St., Milwaukee 14.
Stokes, Jr., J. W., successor to American Coppercote, Inc., 189
Montague St., Brooklyn, N. Y.
Stoket Manufacturing Co., 964 Berry Ave., St. Paul, Minn.
Stossel & Sons, Carl, Front Royal, Va.
Stove Manufacturers Corporation, 182 Mulberry St., Newark, N. J.

N. J. Stow Mfg. Co., Inc., 400 State St., Binghamton, N. Y. Strandwitz & Co., Inc., W. J., Jefferson and Master St., Camden, N. J.

Stratton & Terstegge Co., 1501 W. Main St., Louisville, Ky. Streamline Pipe & Fittings Div., Mueller Brass Co., 1925 Lapeer

Streamline Pipe & Fittings Div., Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.
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Sundstrand Pump Division, 2530 Eleventh St., Rockford, Ill.
Sun-Fire Stoker Corporation, New Albany, Ind.
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Superior Sheet Steel Co., The, Division of Continental Steel
Corp., Canton & Louisville Rd., Canton 1, O.
Superior Steel Corp., Grant Bldg., Pittsburgh.
Supreme Air Filter Co., 126 W. 21st St., New York City.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7,
N. Y.

Supreme Heater & Ventilating Corp., 1911 N. Market St., St. Louis.

Sure Comfort Furnace Co., 900 Des Plaines Ave., Forest Park, T11

• Surface Combustion, 2375 Dorr St., Toledo 1, O Susquehanna Engineering Co., Ninth & Iron Sta., Bloomsburg,

Sutphen & Co., J. W., 150 S. LaBrea Ave., Los Angeles. Swaby Mfg. Co., 2330 W. Cermak Rd., Chicago 8. Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis.

Swartwout Co., 18615 Euclid Ave., Cleveland 12. Swift Mfg. Company, 247 McDougall Ave., Detroit. Syncro-Flame Burner Corp., 57 North St., Willimantic, Conn.

• Syncromatic Corporation, 3373 North Holton St., Milwaukee 12. Syntron Co., Homer City, Pa. Syracuse Fire Door Corp., 900 Canal St., Syracuse, N. Y.

Taco Heaters, Inc., 342 Madison Ave., New York City. Taco Heaters, Inc., 342 Madison Ave., New York City. Tagliabue Mfg. Co., C. J., 550 Park Ave., Brooklyn 5. Tamms Silica Co., 228 N. La Salle St., Chleago.
Tannewitz Works, 315 Front Ave., N. W., Grand Rapids, Mich. Taylor Engineering Co., Metropole Hotel, Cincinnati. Taylor-Hall Welding Corp., 99 Hope Ave., Worcester 3, Mass. Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y. Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O. Tecumseh Products Co., Tecumseh, Mich.
Telsit Insulation Co., 1933 West Farms Road, Bronx, N. Y. Tem Products Co., Midland, Pa. Tennessee Coal, Iron & Railroad Co., Brown-Marx Ridg. Birms.

 Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birm-ingham 2, Ala. Tennessee Enamel Mfg. Co., 4104 Park Ave., Nashville, Tenn. Tennessee Products Corp., American Natl. Bk. Bldg., Nashville,

Tenn. Thatcher Furnace Company, Centre St., Garwood, N. J. Therminsul Corp., 1603 Fulford St., Kalamazoo, Mich. Thermoid Rubber Div. of Thermoid Co., Whitehead Rd., Trenton 6, N. J.

Thompson & Company, 1085 Allegheny Ave., Oakmont (Pittsburgh Dist.), Pa.
Thomson-Gibb Electric Welding Co., 161 Pleasant St., Lynn,

Mass. ThruBond Flashing Corp., 1204 Washington Ave., New York

City.

Tierney Rotor Ventilator Co., 239 4th Ave., S., Minneapolis. Tiffin Eaves Trough Clamp Co., 25 Miami St., Tiffin, Ohio. Tilco-Fin, Inc., 58 Second Ave., Brooklyn. Timken Roller Bearing Co., 1835 Dueber Ave., S. W., Canton 6, Ohio.
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Index TO ADVERTISERS

Accurate Mfg. Works
Barber Gas Burner Co., The 212 Barth Mfg. Co., The 202 Bayley Blower Co. 70 Bead Chain Mfg. Co. 182 Benson Co., Inc., Alex R. 224 Berger Bros. Co. 218 Bethlehem Steel Co. 38 Beverly Shear Co. 223 Bissel, Fred 221 Brauer Supply Co., A. G. 121 Bremil Mfg. Co. 222 Brundage Co. 217
Carey Co., Philip. 206 Carnegie-Illinois Steel Corp. 74 Central-West Machinery Co. 225 Century Electric Co. 37 Champion Tool Co. 225 Chelsea Fan & Blower Co. 197 Cheney Metal Products Co. 223 Cherry Rivet Co. 209 Chicago Steel Service Co. 144 Clarage Fan Co. 32 and 33 Cole Hot Blast Mfg. Co. 223 Columbia Steel Co. 74 Conco Corp. 187 Condensation Engineering Corp. 175 Continental Steel Corp. 56 Cotta Transmission Corp. 35 Crescent Tool Co. 43
Damascus Steel Products Corp .223 Densewood Corporation .220 Des Moines Stove Repair Co .218 Detroit Lubricator Co .36 Dewitt Hotels .216 Dowagiac Steel Furnace Co .226 Doyle Vacuum Cleaner Co .225 Dravo Corp .173 Dreis & Krump Mfg. Co .34
Eisler Engineering Co. .224 Elgo Shutter & Mfg. Co. .201 Evans Machine Co., L. R. .224 Excel Htg. & Air Conditioning Co. .222
Field Control Div., H. D. Conkey & Co. 69 Fireline Stove & Furnace Lining Co 188 Follambee Steel Corp

Gehl Bros. Mfg. Co. 20 General Controls 19 General Electric Co. 2 General Heating Products Co. 21 Gerett Corp., M. A. 20 Gillen Co., J. L. 22 Gleason-Avery, Inc. 20 Grand Rapids Die & Tool Co., Div. of Expert Die & Stamping Co. 16 Grant Wilson, Inc. 16 Gray, G. L. 22
Hall-Neal Furnace Co
Hossfeld Mfg. Co
Ilg Electric Ventilating Co
Jackson & Church Company
Lau Blower Co. 213 Leader Iron Works, Inc. 73 Libert Machine Co. 212 Lockformer Co. 28
Majestic Co. 220 Marley Co., The. 224 Marshalltown Mfg. Co. 215 Maurey Mfg. Co. 22 Mayflower Air Conditioners, Inc. 75 May-Fiebeger Co. 217 McDonnell & Miller 25 Mercoid Corp., The. 127 Meyer & Bro. Co., F 71 Meyer Furnace Co. 59 and 60 Minneapolis-Honeywell Regulator Co. Inside Back Cover
Morrison Products, Inc
Nelson Corp., Herman46 and 47 Niagara Machine & Tool Works53 Northwestern Stove Repair Co76
Olsen Mfg. Co., C. A
Palmer Mfg. Co. 186 Parker-Kalon Corp. 220 Payne Furnace & Supply Co. 138 Peck, Stow and Wilcox Co. 61 Peerless Foundry Co. 20 and 21 Penn Boiler & Burner Mfg. Corp. 52

Whetler Especial with Committee and Committe
Penn Electric Switch Co
Quincy Stove Mfg. Co26 and 2
Randall Graphite Products Corp Research Products Corp
Nesearch Products Corp.
Sall Mountain Co. 20 Schaefer Brush Mfg. Company 21 Schwab Furnace Co. 21 Schwitzer-Cummins Co. 20 Servel, Inc. 55 Sheetlock Co. 20 Simplex Mfg. Co. 20 Skilsaw, Inc. 6 Stanley Elec. Tool Div., The Stanley
Works 6 Superior Sheet Steel Co., The, Div. of Continental Steel Corp. 5 Superior Steel Corp. 7 Surface Combustion 39, 40, 41 and 4 Sturtevant Co., B. F 22 Swarthout Co. 5 Syncromatic Corporation 6
Tennessee Coal, Iron & R. R. Co
Union Mfg. Co. 21 U. S. Air Conditioning Corp. 1 U. S. Register Co. 2 U. S. Steel Co. 7 U. S. Steel Supply Company 7 Universal Power Corp. 22 Utility Fan Corp. 20
Verson Allsteel Press Co
Wagner Electric Corp. 19 Walker Manufacturing & Sales Corp. 19 Waterman-Waterbury Co. 13 Wayne Oil Burner Co. 22 White Mfg. Co. 6 Whitengers Electric Co. 4 Whiting Corp. 7 Whitney Mfg. Co., W. A. 4 Whitney Metal Tool Co. 8 and Williams Oil-O-Matic Htg. Corp. 18 Williamson Heater Co. 21 Wilson, Inc., Grant. 16 Winningham & Co., Harold W. 22 Wiss & Sons Co., J. 20 Wodack Elec. Tool Corp. 22 Wysong & Miles Co. 78
The second secon

York Heat, Div. of York-Shipley, Inc... 50

K EEPING System Moduflow Co automatic hea

... 18 ...224

and 27 ... 11 Cover ...180 ...190 ...220 ...195 ... 19

5 ... 5 ... 214 ... 218

...206 ... 54 ... 205 ... 208

.. 65 aley

... 66
... 56
... 77
and 42
... 221
... 57

... 74

...192

....214 13 23 74

...221

....207 ...191 and 177

p...193

p...193137221 64 45 72 48 and 9181

....219

....16622068 ...224

e... 50

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LISTEN: Blue Locket

.... 18 224 128 . 11 Cover ...180 ...219 ...190 ...220 ...19519 5 214 218 206 54 205 208 65 anley 66 iv. of 77 1 and 42 221 57 63

. 194 . 193 . 137 . 221 . 64 . 45 . 72 . 48 ad 9 . 181 . 219 . 20 . 68 . 203 . 224 . 78



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128

11

219 190

220

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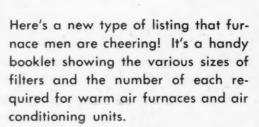
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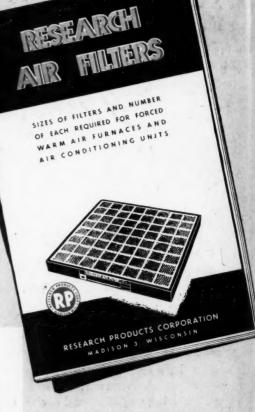
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